

**A Comparison of *5,6*-DMT, Changa &
5-MeO-DMT and the
Near-death Experience:
Qualitative analyses and reviews of the neuroscience**

A thesis submitted in partial fulfilment of the requirements of the University of
Greenwich for the degree of Doctor of Philosophy

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Declaration

I certify that the work contained in this thesis, or any part of it, has not been accepted in substance for any previous degree awarded to me or any other person, and is not concurrently being submitted for any other degree other than that of Degree of Doctor of Philosophy which has been studied at the University of Greenwich, London, UK. I also declare that the work contained in this thesis is the result of my own investigations, except where otherwise identified and acknowledged by references. I further declare that no aspects of the contents of this thesis are the outcome of any form of research misconduct. I declare any personal, sensitive or confidential information/data has been removed or participants have been anonymised. I further declare that where any questionnaires, survey answers or other qualitative responses of participants are recorded/included in the appendices, all personal information has been removed or anonymised. Where University forms (such as those from the Research Ethics Committee) have been included in appendices, all handwritten/scanned signatures have been removed.

First supervisor

Name ...Dr. David Luke... Date ...29/11/2022...

Second supervisor

Name ...Dr. Oliver Robinson... Date ...29/11/2022...

Dedication

This thesis is dedicated to my father, Andrew Michael, who had his own real-death experience from Covid-19 on August 20th 2021

You taught me more than any doctorate of philosophy ever could, from even the meaning of the word 'philosophy' to our sacrosanct "theology clubs"

"The love between father and son is one which transcends time and space", I once wrote you on a card, which I glimpsed as I noticed one of your robins from your office window (one small instance of the myriad synchronicities, Big Dreams and spiritualistic communiqués in which you've since manifested)

The excruciating irony shall never be lost on me that as I "kept my workshop of filthy creation" to strive to illuminate the near-death experience and reconcile mortality, I became blind to what life had afforded me in the once-in-eternity opportunity to experience the Angel of Duality – which is love – between a Father and son. But I hope I may still be the "son in whom you are most proud", which you ritualistically wrote to me, after the completion of this PhD... Well – it certainly comes under some serious "AAPTR"

I reproduce below the verse from Blake's Jerusalem which I forever associate with your dissonant yet pathos-laden intoning, and which I recited to myself upon dropping the yellow rose on top of your coffin. Your death will either serve to ever-impel me toward a 'disclosure' of what death is and means – or teach me to abandon the futile attempt, as Gilgamesh discovered, and yet arrive at the very same Ithacan revelation that this chimera gave me "the marvellous journey"; "without her you wouldn't have set out". Just like me, without you, Dad. Be that for this document – or for my very blossoming of awareness from the Dazzling Dark, into which you have now returned.

I will not cease from mental fight,
Nor shall my sword sleep in my hand,
Till we have built Jerusalem
In England's green and pleasant land.

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Most importantly, there are not yet words constructed in the English lexicon to convey the abyssal depth of my gratefulness to my beloved family – Carlyne, who was almost single-

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Abstract

A complete explanation of the near-death experience (NDE) has still not been developed. However, the elevating effects on entropy and thus on richness of experience by psychedelics implies their possible endogenous function in the, otherwise 'paradoxical', recovery of consciousness near death. Psychometric and semantic analyses have indicated psychedelics, especially those reliably inducing immersive states of novel realities, to act as robust psychopharmacological models of the NDE. Thus far, no studies have yet conducted dedicated, comparative analyses to illuminate the qualitative content, which would have implications for DMT's contribution to this variable, subjective level of the NDE. Virtually no studies have used participants uniquely poised to compare the states by reporting both experiences, nor explored drug mixtures echoing NDEs' complex pharmacology.

The present thesis sought to provide a thorough elucidation of the experience engendered by the serotonergic psychedelic *N,N*-DMT, by conducting a thematic and content analysis of interviews from a naturalistic field study. This also included administration of the near-death experience scale (NDES). This qualitative and psychometric analysis was systematically compared with two different extant studies of classical NDEs. One case study is reported, entailing a thematic analysis and use of the NDES on an individual's 5-MeO-DMT and near-death experience. Another two case studies are reported, involving content analyses and use of the NDES on experiencers of both the DMT-containing changa and an NDE.

The DMT analysis revealed 100% of participants breaking through to another space and 93% reported meeting other entities. Pervasive bodily, sensorial, psychological and emotional transformations in experience are also thoroughly elaborated. The comparison with the near-death experience highlighted there to be phenomenological differences in the appearance and frequency of features, such as encounters with the dead, life review and threshold of no return being much less common in DMT. Sequencing may be also less apparent in DMT. The most novel and enlightening conclusion, however, is that the core level at which discrepancies exist is at the qualitative level of content, where DMT expresses each feature in a fundamentally idiosyncratic way. This said, a small minority of DMT participants more closely mirrored NDEs (while content is still DMT-like). The 5-MeO-DMT

report did not reproduce most of the NDE, including those not reproduced in the above DMT comparison. Although the classical mystical dimensions, especially time-space transcendence, were profoundly modelled by 5MeO. Despite this, the subject self-rated the experiences to be highly dissimilar. A speculative, novel neural model of their NDE is proposed. The changa reports showed a low-moderate similarity with the individuals' own NDE, but high similarity with NDEs in general. One offered a high self-reported similarity, though the other a notably lower one. Non-replicated features in the prior comparisons were observed, except for encounters with the deceased.

The explored drug states can each be considered 'NDE-mimetics' in their differential modelling of only some features and universal failure to generate the same content. Each were, varyingly, individually discussed in terms of their comparability to other exceptional experiences, their possible therapeutic application, and neural correlates. The final discussion elaborated on the NDE's neurobiological intersection with psychedelics, including a 'phenomeneurology' in which the qualitative states were correlated to neuroscientific literature, as well as on the parapsychological components to these states, lastly speculating as to the ontological implications of this. The conclusions of this thesis has ramifications for whether psychedelics can grant access to the near- and real-death experiences of oneself in the inevitable future or of loved ones.

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Publications from the present thesis

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Michael, P., Luke, D., and Robinson, O. (*in review*). An encounter with death: Comparative thematic analyses of the DMT experience and the near-death experience.

*Articles published during the course of this thesis (not contributing to the present thesis)

Almost our whole life is used up in idiotic trifles. By contrast there are things that should excite our curiosity to the highest degree and which, judging from people's everyday lives, excite no curiosity at all:

Where are our dead friends?

Why are we here?

Do we come from somewhere?...

Charles Baudelaire, *Mon coeur mis a nu*

I feel that just understanding near-death experiences will be our first step at healing the great division between science and religion

Melvin Morse, *Closer to the Light*

Chapter I: Introduction and Literature Review

Introduction to the Thesis

Ubiquitous throughout nature, *N,N*-dimethyltryptamine (hereafter DMT) elicits profound subjective effects in human beings which have been paralleled with the near-death experience (NDE). Hypotheses have thus been advanced that propose this molecule being the key mediator in the neurology of the NDE. While several lines of psychological and physiological evidence have supported this postulate, there is also much data highlighting the NDE as a highly complex psychobiological phenomenon irreducible to a single endogenous indolamine alkaloid. As such, a thorough cross-examination of the qualitative nature of the two states is to be undertaken in the present work, alongside a further aim of identifying if there is substantial *neural* data pointing to DMT or other endogenous psychedelic's implication in the NDE. Changa, a smoked admixture of beta carboline-containing plants and DMT (which is the primary constituent) will also be explored. Also to be investigated is 5-MeO-DMT, another, even more potent, endogenous, classical psychedelic, intimately related to *N,N*-DMT. Given the latter constituting only a single case study, and the former's effects being vastly owing to *N,N*-DMT, it will be *N,N*-DMT which will be the main subject of this introductory chapter. Ultimately, the question being asked can be characterised as – Is there the concurrent phenomenological support for these indoles' role in NDEs? In other words – Does the DMT experience and those analogous to it look like the near-death experience?

Introduction to the Comparative Qualitative Analysis

Carol Zaleski (1987), in her classic *Otherworld Journeys* wrote regarding her own comparison of Medieval and contemporary near-death experiences, "The purpose of comparing...[the] vision narratives has been to benefit from the stereoscopic effect, the depth perception, which the juxtaposition of two separate perspectives can provide" (p. 187). In the same way, the effort to judiciously compare and contrast the modern near-death experience with yet another other-worldly experience – that of the psychedelic

experience of dimethyltryptamine (DMT), 5MeO-DMT and changa – which the present work aims at achieving, can also permit us such ‘stereoscopic’ acuity to further elucidate the two and their mutual entanglements.

In the present study, however, there is an additional scope afforded by dealing with the psychopharmacological agents of DMT and its analogous substances, to not only dissect the two experiences’ phenomenologies but anticipate from them their potentially shared neural substrates. On the surface, one may conjecture that if the two states are overwhelmingly resonant then DMT, as found in the human organism, could account for the emergence of NDEs – and conversely, if not then this may undermine the hypothesis. However, this has multiple shortcomings in the argument, such as the over-emphasis instilled in the pharmacological mechanisms versus ‘extra-pharmacological’ factors – but, crucially, the problematic logic that if two experiences are virtually the same then the substrates must also be the same. In this case, that relates to DMT experiences and NDEs emerging via the same trigger of DMT. It is equally as plausible that they share a common downstream mechanism to account for the overlap, where one key, known neural effect of DMT, the disintegration of the Default Mode Network (DMN), could be argued to be one key mediator of the NDE (although the neuroscience of the NDE is as yet in its infancy, this is for purposes of illustration). The question then, however, would remain as what were the original causative mechanisms for this downstream event – which even if the experiences are very similar, may or may not be DMT. For example (as discussed further below), other neurotransmitters like serotonin, or NMDA-antagonists, or dynorphin may instead be released during NDEs, and while acting on distinct receptor systems appear to converge on similar final pathways (specifically again, the disintegration of the DMN). In similar vein however, DMT need not be concluded to be the only transmitter deployed during NDEs, but all the above named and many others may be implicated, and thereby differentially contributing to the NDE. In this way, each compound may best account for particular components of the phenomenology evinced by NDEs – and only comparative phenomenological studies such as the present one would be equipped to indicate which experiential features may correspond to which given substance.

To return to the idea of ‘extra-pharmacological’ factors behind the NDE, such as the psychological or cultural, or ‘set and setting’ – although at least one neural element may be

endogenous DMT secretion (and its end-point brain changes), and this may be capable of explicating certain features of the NDE – it is the criteria of set and setting which may exert their effects to give rise to other features. However, critically, it is these criteria which must be working in tandem with the neural elements to bring the NDE's wholeness into being, given the nervous system as representing the critical nexus zone between the biological and the environmental. As such, the neural and psychological may be more fundamentally responsible for the whole experience, yet at different levels of analysis. The structural phenomenology i.e., the thematic features of the experience may more appropriately be linked to the neural components – whereas the qualitative content may be best connected with the psychological influence. That is, bottom-up, and more objectively predicated, versus top-down, and more subjectively based, mechanisms being important considerations regarding two essentially orthogonal dimensions of the experience (Petitmengin, 2006; Timmermann et al., 2019; Varela & Shear, 1999).

In applying this to the present comparative study of this thesis, if resultant findings reveal that the thematic features, or at least some, are the same, it is likely that this would rest on neural, or neurochemical, shared mechanisms – such as DMT release. However, as described above, this need not be DMT given other transmitters or triggers which can converge on the same final end-point. If these features, or a subset of them, are different between the states, again neural activity is likely the contributor, such as the wealth of terminal brain activity that occurs near-death (as discussed further below). If this other experiential layer, however – the content, which is by nature more sensitive to cultural and psychological processes – is exhibited to be different, then the evident differences between DMT experiencers and near-death experiences in terms of expectation and circumstances may be the better candidates for explanation. Similarly, if the content is the same, any overlap in these set and setting or top-down influences may also be important. However, as stipulated, the neural and psychological are never mutually exclusive and are instead inextricably entangled, and so if the DMT and NDE content was illustrated as different for instance, the neural divergences between the states would likely also play a role. In all, while there may be one neurochemical overlap – that of DMT production – there is a large spectrum of other neural activity in the NDE (albeit some of these may converge on DMT's mechanisms and thus the resultant experience), and the psychological circumstances are

likely to be mostly unshared also. As such, it may be that the two types of experience may not be significantly resonant with each other – but any virtually identical elements could be more robustly argued as DMT-deriving.

Ultimately, only a phenomenological and qualitative comparison such as the current thesis can work to disentangle which features and levels of experience are convergent or divergent between this particular psychedelic and near-death experience. In this way, this will allow an elucidation of which features/levels may more plausibly emanate from such aforementioned neurally-predicated contributions, and which from the higher-level contextual factors also in play.

Structure of the thesis

In terms of an overview of the overall structural organisation of this thesis – the majority of the rest of this introductory chapter will constitute a review of the literature, spanning phenomenological studies of the psychedelic, including DMT, experience and the near-death experience, as well as their experiential comparability, as well as studies indicative of neurochemical or other neural mediation of the NDE, and lastly the more anomalous features of these experiences having implications for said neural mediation. The final part of this introductory chapter acts to provide more of the context and the rationale for the undertaking of this thesis, alongside the specific research aims.

The immediately following chapter to this introduction sets out the overarching methodology which serves to frame this thesis and the epistemological approaches to the composite studies, focussing on the relevance of the application of both critical and ‘psychedelic realism’ – as well as the specific methods for each study, which are virtually identical for the first three, given their being based in a single naturalistic study of DMT, and also not dissimilar for the remaining two, given their case series structure. In detailing these studies slightly more – the first empirical chapter, chapter 3, will detail a thematic analysis of the DMT experience, specifically focussing on the otherworldly phenomena of entering other worlds and encountering other entities. The next, chapter 4, will be largely the same, except for the focus here residing in all the remaining experiential domains of the DMT state. That is, except for those domains pertaining to the near-death experience, which will

be the specific analysis of chapter 5 accompanied by its crucial comparison with raw and analysed data of the NDE from another author's publication. Both chapters 6 and 7 revolve around mixed-methods case studies of experiencers of both NDEs and analogous experiences to DMT; an NDE and 5MeO-DMT experience in the first, employing thematic analyses, and NDEs and changa experiences in the second, employing content analyses.

As for the discussion-focused chapters – the first discussion chapter, chapter 8, seeks to draw more immediately connected conclusions from the studies, by beginning with a summary of the results, segueing into the possible applications of thesis, followed by the remaining limitations, and lastly indications for future research. Finally, while not constituting an empirical chapter, the last discussion chapter, chapter 9, aims to be largely dedicated to a neurophenomenological treatment of the findings of the preceding empirical studies. That is, couching the results of the DMT-NDE similarities and differences in a cognitive neuroscientific paradigm, determining if what is known about the neural correlates of psychedelics and NDEs can account for the observed phenomenological and qualitative comparisons – and the consequences of this for endogenous psychedelics' role. Failure of some observed features to be incorporated into any neuropsychological frame is to be discussed, where this then bleeds into the relevance of parapsychological phenomena inherent to these two states, and lastly into discussion of more inclusive paradigms to understand the entire experiential repertoire examined in this thesis, and the ontological implications thereof. A brief conclusion ultimately follows this chapter as a final statement, which also addresses, though not a central thread to the present thesis, the powerful personal consequences of these extraordinary human experiences and their profound implications not only at the individual, but at the collective level.

Situating and Justifying the Present Work

One of the foremost rationales for the undertaking of the present thesis and its component studies is to provide a phenomenological investigation into the DMT and near-death experience in tandem, which surpasses in detail and depth past studies which have attempted to do so. Indeed, only very few studies have had specific aims to relate the two states under a single design. The most salient of these are Timmermann *et al* (2018) and Charland-Verville *et al* (2014). The former is given a dedicated review in the above section,

DMT models the NDE, under ‘DMT may simulate the phenomenology of the NDE’, essentially finding experiences under intravenous DMT did not differ from NDEs caused by life-threatening events. The latter is given dedicated review in the above section, *Near-death experiences, Fear-death experiences or NDE-like experiences*, under ‘The Near death experience’, reporting that NDEs from comas as compared to those elicited from meditation, epilepsy, syncope and drugs – also did not differ significantly.

Critically, the means used for comparisons in these two studies was the near-death experience scale (NDES; Greyson, 1983) – that is, a measure of only 16 generic items to which the experient must respond with only a 2-point Likert scale. The problem is that such a scale is only sensitive to the very gross structural features of the experience, while neglecting the myriad ways by which these particular experiential structures may manifest. For instance, the scale involves items such as separation from the body, entering another world, or encountering the dead or other mystical beings – whereas, the idiosyncratic expression of each may appear as an autoscopic vision of the person’s body as they glide above it and any details of verified events, arcadia-esque or elysian-type bountiful fields and valleys, or humanoid beings composed of light emanating love and wisdom. In this way, the superficiality of relying on this measure of NDEs has likely inflated the surmised sameness of the NDE and DMT state. The above studies employing this measure can conclude that this syndrome of basic elements generally prototypical of the NDE are reliably evoked by DMT or other NDE-like experiences. However, only by taking into due consideration the nuanced, symbolic expressions of these cruder, thematic features can one determine if the experiences are indeed the same, or more appropriately, to what degree they are similar or dissimilar and in what manners.

As such, while Timmerman *et al* (2018) never explained the identified DMT-NDE correlation by reference to endogenous DMT’s release during the NDEs, emphasis should be placed on the authors’ usage of the term ‘*models*’ when stating “DMT models the near-death experience”, indicating the basic, though sufficient, experimental simulation of the given phenomenon to afford productive scientific employment of it and theorising from it. It can be argued that the report’s conclusions of the two experiences being insignificantly different (according to the scale) may be misleading – a misrepresentation perpetuated by media coverage following its publication. Such simplistic interpretations were also originally

promulgated by Strassman's book *The Spirit Molecule* (2001), which in the main only entailed participants' general reports of entering other worlds inhabited by other beings, sometimes feeling like they were dying or reporting mystical experiences – yet DMT-release has indelibly been associated with the NDE in popular consciousness since its proposition.

The rationale for undertaking a novel thematic analysis of the DMT experience, presented in chapters 3-5 of the present thesis, is based first on several improvements on that already reported (Cott & Rock, 2008), including a high-dose DMT experience with greater sample size, and in a semi-controlled setting immediately prior to the detailed microphenomenological interview. Additionally, a core component to the present thesis – and subject of chapter 5 – is to compare this novel thematic analysis with that of the near-death experience published by Cassol *et al* (2018). Since the latter was relatively in depth, incorporated recording theme frequencies and had a large sample, this was another reason to conduct a novel DMT thematic analysis to also include and thus parallel such depth, frequency analysis and more participants, so as to accommodate the comparison process. In addition to this, Charlotte Martial & Helena Cassol, the lead authors on this thematic analysis of NDEs, act as the sole collaborators on the present thesis, as they shared the raw qualitative data underlying their analysis via the University of Liege. This further required a novel DMT experiential dataset so as to more directly compare qualitative extracts between the two. Not insignificantly, this Liege research group are the same group supplying the psychometric data of the NDE scale results to Timmerman *et al* (2018)'s study of DMT modelling the NDE – meaning that the implication of chapter 5 herein will be to directly compare a novel DMT dataset with the same Liege group's experiential data (albeit from different NDE experiencers) in terms of the *qualitative* versus quantitative content.

Ketamine Dreams and Realities by Jansen (2000) featured the book's author and one other correspondent reporting their respective ketamine experiences (a dissociative anaesthetic) as well as their own near-death experiences, which they both claimed to be the same. As such, Jansen argued for a strengthening of his hypothesis of ketamine-like compounds being released in the brain at death, based on the unique vantage point of a single individual having sampled from both experiences and being especially capable of assessing their comparability. This has never been reported in the case of DMT or its analogous compounds, hence the focus of chapter 6-7 of this thesis revolves around case studies of

interviews and questionnaire analyses of participants personally acquainted with both the DMT-containing changa and the NDE, and 5MeO-DMT and the NDE, their opinions on their similarities, and whether they believe bodily-derived DMT may have induced their own NDEs. This latter element may be useful to discern if those few people having had both experiences are more likely to endorse that DMT did influence their NDE, as opposed to the significant population of NDE experiencers and enthusiasts, beyond the psychedelic community or those with psychedelic experiences, who are resistant to such notions of NDEs' neurochemical mediation. Qualitative analyses are performed to ascertain researcher-led assessments, further to the self-report, of the experiences' similarities.

Any conclusions as to the similarities or disparities between any of the examined psychoactive substances and the NDE can be used to forward or deter an argument for their usage for psychiatric or even palliative care needs. The near-death experience has for decades been documented as a transformative event, life-changing in its lasting force, including not only less existential anxiety but lesser suicidality, materialistic concern and invigorated spirituality and kinship with others. In recent decades psychedelic drugs, mostly psilocybin, (DMT-containing) ayahuasca and MDMA, have been evidenced more and more to be potentially psychotherapeutic, with significant results in alleviating depression, addiction, PTSD and indeed, anxiety accompanying terminal illness. If the DMT or analogous experience in its acute form may be sufficiently reminiscent of the NDE, then, it may join the above substances as another possible candidate for medical administration to these patient populations. Perhaps the most logical population, in comparing experiences with DMT and those near-death, is the terminally diagnosed, where if convincingly comparable then the drug may similarly work to assuage fears of this existential reality faced by these individuals – and eventually us all. Recent years have seen a wave of US states decriminalise or even legalise these drugs, and arguments could be forwarded that we are all 'terminal', and as such the dying-like experiences engendered by such psychedelic substances including DMT, especially if showing particular 'thanatogenic' potential (generative of a dying-like state), could be used to understand and come to terms with our mortality by having glimpsed its nature. On the other hand, if the DMT experiences appear considerably different to the dying process it may well be unethical to administer it under such auspices for giving a false view of death – and elements may even be adversely affecting.

From mechanism to meaning

The mode by which the purpose of the thesis is framed above, and indeed the wider project of analysing NDEs via the lens of psychedelics – is presently as an assessment of the support for the endogenous psychedelic theory of NDEs (or at least, the phenomenological level of it, as above). This, however, can be argued to not be best evidenced using the methodologies of qualitative analyses at all; the ‘sacrifice’ of an animal and the detecting of such endo-psychedelic secretions (or doing similarly in humans using blood analyses near-death or even using PET imaging etc) would definitively answer this ultimate question. One radical way – but a way by which a not insignificant re-invigoration of meaning may be imputed to the present work – that this series of studies may be re-viewed is the following: In light of the fact that not everyone can simply have an NDE on demand, one miracle of psychedelic substances is that they virtually democratise such mystical subjective experiences, which clearly have at least some import for the near-death state. In this way, the investigation herein may not just weigh in on the putative neurobiology of the NDE – but much more saliently, and meaningfully, be instead seen as potentially providing illumination for whether psychedelics could legitimately grant one access to a state which does indeed look and feel like a near-death experience.

This would then enable one to glimpse into and prepare for one's own inevitable fate (as practiced by Tibetan Buddhists via meditation or dream yoga). This may apply not only to one's future psychedelic journeys, but also those past. Just one implication of this may be that any highly distressing trips may prime the person to believe they will befall this again as they die (especially if considering state-dependent memory, where if the two states and thus brain-states *are* similar, any subsequent experience may re-access the memory of the original), and so provoking death anxiety. Naturally, the opposite is also true, assuaging death anxiety upon an equanimous sojourn. However, much more poignantly, and movingly (as more aligned with many indigenous societies' sacramental use of their entheogens), any findings that psychedelics genuinely permit a person access to – to all intents and purposes – an NDE would give them the privilege to empathise with the experiences which deceased loved ones had the moment that they passed on (and possibly, if entertaining psychedelics' metaphysical value, or NDEs indeed being a window into a continued experience, see even into their post-carnate lives). This need not be clinically reduced to have implications for

grief therapy, for instance – but may be a touching point of reflection for any current ‘user’ of these substances, or of course, if they eventually move into a space of decriminalisation/legalisation...

If one takes a psychedelic – can they taste that mystery with which their departed beloveds have forever interfused?

Research Aims

Chapter 3, 4 and 5 of the present thesis will represent studies derived from the field study of DMT use, which will seek to cast light on the breakthrough DMT experience, by conducting a naturalistic study and analysing interviews by focusing on qualitative content. These studies specifically aim to comprehend all dimensions of the DMT experience, including the immersion in other worldly spaces and the ‘entity encounter’, as well as those experiences with echoes of the NDE, which will specifically act as the thrust of chapter 5. Chapter 5, as such, introduces the comparative project which is also the drive of the final two chapters, where such comparison to explore psychedelics’ role in NDEs is largely supported by suggestions of psychedelic treatment inducing inner awareness in coma patients, in turn akin to the near-death state. This chapter’s objectives revolve around the improvement on psychometric comparisons, by employing thematic and content analyses and comparing between the DMT and NDE state so as to comment on the possible role of DMT. The final two chapters constitute those seeking to understand the NDE-psychedelic relationship from those experiencing both, never done before with 5-MeO-DMT (penultimate chapter) nor with a drug admixture, such as changa (last chapter). The former will achieve this via a thematic analysis of the psychedelic and near-death experience, and the latter through a content analysis, both in a mixed-methods fashion including quantitative self-rating which includes the NDE scale.

Very importantly, this thesis has already thus far achieved an in depth plumbing of the literature as regards both the phenomenology and neuroscience of psychedelic, DMT states, and the near-death experience. A dedicated discussion chapter will subsequently close the enveloping of the thesis in a similar vein, by couching the qualitative analyses conducted in a detailed review of the neuroscientific literature – in a parallel way to how many of the

chapters included discussions of the relevant neuroscience. In this discussion chapter, this is referred to as the here neologised 'phenomeneurology'. This is an inversion of the approach of 'neurophenomenology' which in part suggests that the gross features of the experiences would have their definable correlates in brain. As such, Timmerman et al's (2018) questionnaire study identifying these structural features to be the same for both DMT & NDEs is highly informative in terms of the likelihood that general neural processes are consistent between both. However, the subjective, qualitative content of the two types of experiences have not been examined (virtually at all), which is itself less capable of being subsumed by neural models. Hence, while the methods of this thesis are vastly qualitative, it is still rooted in the neural sciences, albeit with an emphasis on content which is better equipped at distinguishing the two experiences and which, in turn, does not only reductively explain them (this is further expanded in the discussion, in part by linking with parapsychology).

Concretely stated aims of this thesis are as follows:

- 1) To perform a substantive, review of the neuroscientific literature on psychedelics, DMT and the NDE, to both precede and conclude this thesis
- 2) To understand the nuanced quality of the *N,N*-DMT experience, by conducting a naturalistic study and performing a thematic and content analysis of the experience, including those thematic elements relevant to the near-death experience
- 3) To make systematic comparisons between the above DMT analysis and prior thematic analysis / extant data about the near-death experience
i.e. Between-groups comparison of the DMT and NDE
- 4) To construct case studies, qualitative and basic psychometric analyses of experiencers of both *changa* and NDEs
i.e. Within-subjects comparison of the DMT/analogous experience and NDE

- 5) To construct case studies, qualitative and basic psychometric analyses of experiencers of both 5MeO-DMT and NDEs
i.e. Within-subjects comparison of the DMT/analogous experience and NDE

Literature Review

The first two sections of this literature review will cover the major research thus far into the phenomenology of the DMT experience and NDE. This is then followed by two further sections pertaining to the experiential, and indeed the neurobiological interface between the NDE and the psychedelic experience – including that of DMT – which will also look at what the outcome of such a comparison between NDEs and DMT experiences may actually mean, and how it may be interpreted in terms of DMT’s contribution. The next section covers anomalous experiences inherent to both the psychedelic and near-death experience, which may have implications for the ontology of the states beyond the previous neurobiological framing of them. Finally, the last segments will expand upon the rationale for this comparative phenomenological study, making special reference to certain reports upon which this study aims to improve, and ending with this thesis’ research questions and aims.

The Psychedelic and NDE experience: Phenomenology, Neurobiology – and their intersection

The DMT Experience

N,N-dimethyltryptamine (DMT) is an indole alkaloid and potent serotonergic, or ‘classical’ psychedelic, a drug class which is considered to exert their effects via the 5-HT_{2A} receptor, though downstream GABA, glutaminergic and dopaminergic systems may be modulatory (Halberstadt et al., 2018). DMT is virtually ubiquitous in nature (McKenna, 2018) and endogenous to humans. Reviews of its detection in the urine, CSF and blood of human beings points to a maximum concentration of 55ng/mL (though this may be largely overestimated given many older studies likely erroneously detecting other substances; Barker et al., 2012). Dean et al. (2019) have evidenced co-localisation of the enzymatic

machinery prerequisite for DMT synthesis (INMT and AADC) in mammalian brain tissue, as well as the presence of Indole-ethylamine-methyltransferase (INMT) in the human cerebral frontal cortex and pineal gland.

Very recently, DMT, alongside harmine (one of the ayahuasca beta-carbolines), bufotenine and cocaine, was identified in a ritual bundle from the Bolivian Andes dated to at least 1,000 C.E (Miller et al., 2019). Thus, the DMT experience has long since been a component of the human experiential repertoire. However, use of DMT (and similar compounds; 5MeO-DMT and 5MeO-DIPT) in contemporary society, at least in the USA general population, is relatively rare at 0.7% (Palamar & Le, 2018). Survey research slightly prior to this finding have projected elevations in its usage (Sledge & Grim, 2013), and a larger proportion (24%) of DMT users were identified as new users compared with other psychedelics (Winstock et al., 2014).

The precise nature and extent of DMT's physiological functions as an endogenous amine are yet to be fully elucidated (Rodrigues et al., 2019). However, mounting evidence gestures to a multitude of roles in the peripheral and central nervous system, entailing possibly fulfilling criteria for being a neurotransmitter and neuromodulator, including at the 5-HT_{2A} site – as well as mitigation of cellular stress in nervous tissue and peripheries, via activation of the sigma-1 receptor (Carbonaro and Gatch, 2016; Rodrigues et al., 2019).

When DMT is exogenously administered it is capable of generating brief, yet fundamental shifts in the structure and content of consciousness. In light of this, especially its uncanny proclivity to engender subjective experiences of sensed presence, or interactions with other-than-self social agents, it has been suggested that DMT may not play a part in waking consciousness, but may model, or may be implicated in, a host of altered states. These range from dreaming or psychosis (Dean, 2018), to spontaneous transpersonal experiences such as alien abduction experiences (Luke, 2012) – or near-death experiences (NDEs) (Strassman, 2001; Timmermann et al., 2018), DMT's precise qualitative relationship with which will be the dedicated subject of chapter 5 of this thesis.

Psychedelic research is presently thriving in a 'renaissance' since the drugs' abrupt prohibition. This resurgence was arguably kindled by Strassman's original human studies with DMT (Strassman & Qualls, 1994; Strassman et al., 1994) which, though detailing the

experiences in his now famous book (Strassman, 2001) was predominantly physiological in scope, consistent with much of this subsequent new wave of research being concentrated on psychedelics' clinical applications and neurobiological correlates.

Few studies have been dedicated to the acute phenomenology of psychedelics more generally (e.g., ayahuasca: Kjellgren et al., 2009; Wolff et al., 2019; psilocybin: Turton et al., 2014; ibogaine: Schenberg et al., 2017; see below re: DMT) – while some have explored the subjective mediation of psychedelic therapy (e.g., ayahuasca: Loizaga-Velder & Verres, 2014; Dos Santos et al., 2018; psilocybin: Belser et al., 2017; Watts et al., 2017; ibogaine: Schenberg, et al., 2017; LSD: Gasser et al., 2015).

Beginning with a surveying of DMT use and experience in modern and indigenous Australia (Tramacchi, 2006) and a brief qualitative analysis (Cott & Rock, 2008), there has been a recent surge in interest in the phenomenology of DMT in particular, including its cultural history, its penchant for gnostic insight, and its essential liminality (St John, 2015, 2018), the remarkable consistency in many of its phenomenological motifs (Gallimore & Luke, 2015) and a comprehensive survey (Davis et al., 2020). This latter, further detailed below, was focused exclusively on the 'entity encounter', itself a subtopic of significant attention with direct implications for mechanisms of social cognition – and possibly for ontology (Luke & Spowers, 2022, 2018; Luke, 2008, 2011). The 60+ years since the first DMT experiments has seen an array of attempts to distill DMT's profound subjective manifestations, which will themselves be condensed systematically in the following section.

Even greater intricacies of the compound's subjective sphere, including the entity encounter phenomenon on which there has been special interest (Chapter 3; Davis et al., 2020; Luke and Spowers, 2018, 2022), may be illuminated after reports on continuous infusions of DMT conducted (E.g. Smith, 2021) based on a pharmacokinetic model to sustain peak blood-concentrations (Gallimore and Strassman, 2016). Regarding recent enthusiasm for DMT's clinical potential, such beings may be projections of facets of the broader self with deeply archetypal characteristics, both positive and challenging – which may both be a productive (Davis et al., 2020b; Lutkajtis, 2020; Chapter 3) and possibly difficult feature to navigate in the therapeutic process (Chapter 3; Whitfield, 2021; Hill, 2019).

Phenomenological cartography thus far

The nuanced relationship between DMT/Changa/5MeO-DMT and the near-death experience will be the subsequent focus of chapters 5-7 of the present thesis. The following section however serves to survey the most salient studies concerning DMT phenomenology, each in turn qualified with how these reports so far appertain to and resonate with the NDE. In so doing however, this section can offer only a cursory glimpse at the states' relationship, and may give the ostensive impression of their being more intimately related than may be concluded by the thesis' latter chapters, whose central function is ascertain the level of comparability via systematic and nuanced methods. This section is also comparatively short versus the following segment regarding NDE phenomenology, owing to much of DMT's subjective effects being discussed more deeply in chapters 3-5, which deal with the present work's thematic and content analysis of DMT.

In April 1956, Stephen Szara self-administered intramuscular (I.M.) DMT – representing the very first human experience with pure DMT – and at 1mg/kg reported sensations such as tingling and nausea as well as “brilliantly coloured oriental motifs and wonderful scenes altering rapidly” (Szára, 2014). Sai-Halasz et al., (1958) constitutes the first human study administering I.M. DMT to healthy subjects, mostly colleagues, where the authors concluded the discovery of a novel “psychotogenic” agent. They also pertinently listed the term “near-death experience” (in fact almost 20 years prior to Moody's ‘coining’ the term), albeit with the lowest incidence of the listed subjective phenomena (6/30, approx. 20%). Regrettably, only a few experiential quotations are provided, but particularly relevant for the discussion of DMT and NDE inter-relationships, is an account by Dr. E. C.H. beginning with the words “This is death”, and involving a “new... beautiful world” which was “frightfully realistic” inhabited by “sunlit Gods”. Incidentally, Boszormenyi & Szara (1958) as well as Turner & Merlis (1959) both injected mostly schizophrenia patients with DMT, the latter apparently finding relatively stunted subjective responses and the former again classifying the resultant phenomenology in psychopathological terms including depersonalisation and ‘disturbances’ in most all domains of experience.

Strassman (2001), predicated on his pioneering administration of the drug to over 60 participants authored ‘DMT: The Spirit Molecule’, which was instrumental in the

popularisation of the meme of DMT from the pineal gland being secreted at death and ‘triggering’ the near-death experience. This, however, was based only on bed-side notes of post-trip conversation, and an emphasis on only two participants with NDE resonances of a total of sixty (see Chapter 13: Contact through the veil). In the same year, based on internet reports, Meyer (1992) stratified the DMT experience into levels of depth, which again start with vivid geometric patterns, including a breakthrough experience entailing tunnels into another world (Level 2); 3D or 3+ dimensions of space i.e. *hyperspace*, entailing contact with intelligent, communicative entities (Level 3); and The white light (Level 4), akin to the NDE. Similarly, Shanon (2002) listed fourteen progressive experiential stages beginning with such elemental visual imagery, then toward proto-scenes (stage 8), fully-fledged scenes (9), interactive scenes (10), and ending at soul-flight, celestial or heavenly scenes, “virtual reality” i.e. virtually indistinguishable from reality (including a plethora of “supernatural” beings), and finally “supreme light”. Thus, these dovetail with Meyer’s latter phases – with the otherworldly immersion, entity contact and, of course, the light being reminiscent of (usually deeper) NDEs. However, notably, the natural landscapes, as well as the “celestial”, “semi-divine” beings, and encounters with the dead of Shannon’s taxonomy, versus DMT, are substantially more NDE-resembling.

At the time of writing, the only presently published thematic analysis of the DMT experience is by Cott & Rock (2008) though suffering from significant limitations – not least in its use of retrospective written narratives submitted online, and only identifying nine highly generic themes which were superficially expanded upon. For instance, as relevant to the correspondences with the NDE, veridical hallucination, involving emergence into other worlds and a reception by otherworldly beings considered to be genuinely real, as well as spirituality, sometimes exclaimed to be a religious experience entailing personal or universal insights.

One of the key-most studies on the DMT-NDE dialogue is the reliable ‘modelling’ of the near-death experience after Intravascular (I.V.) administration of DMT as reported by Timmermann et al. (2018) which will be given specific attention in chapters, mainly chapter 5, dedicated to the experiences’ relationship. Griffiths et al. (2019) have also published a large survey finding comparability of classical psychedelic (including DMT)-induced and spontaneous ‘God encounter’ experiences, a prominent episode in many, typically deeper,

NDE accounts. A content analysis, specifically of the entity encounter experience prototypical of 'breakthrough' DMT states, again from internet trip reports, was performed by Lyke (2019). She reported that the most often encountered entity-types involved, albeit ambiguously, undefined/formless beings (29%) closely followed by humanoid beings (22%), and the commonest form of experient-entity interaction, by far, was showing/teaching/guiding (25%) – certainly the function typical of NDE beings.

In similar vein, Davis et al. (2020) undertook a substantial online survey of DMT entity-encounter experiences of 2,561 respondents after inhaled DMT. While exceptionally detailed, one could generalise from the most frequently endorsed responses that they were, in the main, telepathically communicating guides or helpers (or more specifically, spirits or aliens) with a predominantly positive disposition including joy and love, and overwhelmingly intelligent, benevolent and sacred, as well as more real than real. Most involved receiving a message or task such as personal insight or love, and a minority included a future prediction. As regards after-effects, there was an almost two thirds reduction in atheistic belief after the encounter and over three quarters consistently endorsed enhancements in satisfaction with, attitudes about, and meaning in life, spirituality and view toward death. While the authors do not elaborate on convergences with the NDE, each one of the above phenomenological dimensions and long-term changes are intimately associated with near-death experience sequelae also. Notably however, *aliens* do not emerge in the NDE realm.

Though not DMT in its pure form, the phenomenology of ayahuasca was mapped by Shanon (2002) whose experiential phases culminated in soul-flight, celestial scenes and supreme light, as well as space voyages and advanced city-scapes, even evolutionary scenes – familiar experiences to many NDE experiencers. The beings populating the ayahuasca realm and resident to the NDE worlds encompass the deceased, angels or 'beings of light', semi-divine beings from religious systems, and beings of death. Again though, notable deviations entail such landscapes as theme parks or folkloric, therianthrope, alien or animal beings.

In the last three decades there has been a surge in interest in the experience, mechanisms and clinical use of psychedelics – and in more recent years, an interest in how these interface with the near-death experience. The very 'first wave' of psychedelic research, though, began much earlier in the 20th century and enjoying a peak in the 60's prior to prohibition, while the NDE phenomenon had had its nascent systematised research

commence as early as the mid-19th century (Splittgerber, 1866; given the experience of death, of course, long preceding the emergence of psychedelics into the academy) – though the more commonly cited being Heim (1991; expanded below). The term “NDE” was injected into the popular psyche from 1975, most famously by Moody's (1975) *Life after Lifer*, though Christoph Hampe's (1975) lesser known *To Die is Gain*, with very much the same aim, was also published independently in German that same year.

The Near-Death Experience

Definition

The near-death experience has been defined in several different ways by different authors. Moody (1975) offered one of the original, and looser, definitions as “any conscious perceptual experience which takes place during...an event in which a person could very easily die or be killed...but nonetheless survives” (p. 124) – while later, more specific formulations, include Greyson (1998), stating “NDEs are profound psychological events with transcendental and mystical elements, typically occurring to individuals close to death or in situations of intense physical or emotional danger”.

Prospective studies in cardiac arrest – ‘classic NDEs’

The indispensability of understanding the NDE is reflected by its impressive prevalence in the population of 4-14% (IANDS, 2021). In terms of incidence rates determined by prospective studies of NDEs after cardiac arrest, Parnia et al. (2001) report 6.3%, though representing only 4 patients, while Schwanager et al. (2002) report 23%, though again only out of 30 patients. Greyson (2003) study in Virginia, USA, demonstrated 10% of 116 patients to report NDEs (versus 1% in other cardiac patients). Van Lommel (2002) study in the Netherlands amongst 344 cardiac arrest patients evidenced 62 patients (18%) to report NDEs, of whom 41 (12%) described a ‘core’ experience (defined by a score of 6/29 on Ring, 1980's NDE scale). Given the latter two studies encompassing much larger samples, their estimates of 10-18% may be most reasonable.

In regard to the exploration of multiple demographics and individual differences associated with the reported NDEs across these prospective studies, focussing on these latter two more comprehensive reports – Van Lommel (2002) showed that their occurrence was not associated with duration of arrest or unconsciousness, or medication. Frequency of NDE was affected by age, where those under 60 had more NDEs ($p=0.012$), corroborating (M. Morse, 1996) (likely inflated) finding of an 85% NDE incidence in children, as well as 48% in a sample of mean age 37 (Ring, 1980) and 43% of mean age 49 (Sabom, 1982). This is versus van Lommel et al's 18% incidence with a higher age of 62, and Greyson (2000) also finding significantly deeper NDEs with younger ages. Patients with memory defects after prolonged CPR also reported fewer NDEs, however at 2 year follow-up 2 subjects reported a core NDE and another 2 subjects recalled positive emotions, none of which were originally reported. There may also be an 'NDE prone personality' (or indeed neurology), given that 10% of NDErs (near death experiencers) versus only 3% of non-NDErs in van Lommel et al had experienced NDEs in their past ($p=0.035$). Depth of NDE was influenced by undergoing CPR outside hospital settings, as well as women having deeper experiences ($p=0.011$), supporting Ring (1980) and Greyson (2000), though this could be an artefact of women's openness to sharing experiences, yet women do tend to score higher on anomalous perception questionnaires (Brugger & Mohr, 2008). Significantly more subjects who had undergone NDEs, especially deeper ones, died within 30 days of CPR ($p<0.0001$), this correlation most likely owing to the severity of the cardiac dysfunction. For instance, 10/23 of 'deep' experiencers (43%) died within 30 days, compared to 24/282 total NDErs (9%) ($p<0.0001$). This said, the authors also nebulously state "seriousness of the crisis was not related to occurrence or depth of the experience".

248 patients (74%) were interviewed within 5 days after their CPR. Of the 74 patients who were interviewed at 2-year follow-up, 42 (57%) had previously heard of NDEs, with no apparent relationship between NDE foreknowledge and its occurrence. 62 (18%) patients reported some recollection of the period of their clinical death. Of these, 21 (6% of total) had a superficial NDE, 41 (12% of total) had a core experience, while 23 of this core group (7% of total) reported a deep or very deep NDE. As such, this serves to confirm Ring's (1980) identification that fewer individuals report progressively deeper NDEs. The NDE features and their incidence were as follows: Positive emotion (56%), Awareness of death (50%),

Deceased persons (32%), Tunnel (31%), Celestial landscape (29%), Out of Body Experience (OBE) (24%), The Light (23%), Colours (23%), Life review (13%) and Presence of border (8%). The majority of patients did not report fear during their cardiac arrest, as it happened far too unexpectedly to permit processing opportunity and thus cultivate a fear of dying, which could suggest that the psychological defence against dying may not be a robust rationale for the driving of NDEs. 53 (72%) of the 74 interviewed at 2 year follow-up were religious, where at this time point NDE experiencers had significant increases in belief in afterlife and decreases in fear of death, as well as enhanced sense of empathy and intuition versus non-experiencers, and depth of NDE was related to endorsing statements such as interest in the meaning of one's life and being loving, accepting persons. 8 year follow-up included 23 patients, all of whom could still report their NDE "almost exactly" as compared to their original reports.

Greyson's (2003) study identified that NDErs and non-NDErs did not differ in terms of cognitive function (based on Mini-mental state examination, MMSE), physical activity capacity, degree of cardiac dysfunction, coronary prognosis or objective proximity to death. That the MMSE was comparable might potentially undermine the argument for NDEs involving memory dysfunction such as false memory construction (though it is unclear if the MMSE was completed before or after the NDE event). That ethnicity or religious affiliation was not also monitored is unfortunate, as a relationship to the content of the NDE would have otherwise been possible. NDE reporters were more likely to be of a younger age, have greater acceptance of death, report prior 'paranormal' experiences such as déjà vu and other altered states – but not 'psychic' experiences such as precognition or clairvoyance – and to have lost consciousness at the time. This accords with previous above studies showing an inverse relationship with age and NDE incidence, and proneness to exceptional experiences including subsequent NDEs (K. Ring, 1980; Pim Van Lommel, 2002), and raises if lesser death anxiety may, at least in part, not only be a well-known consequence of NDEs but also a predisposing factor, possibly according with openness to self-altering experience, and its inclusion of absorption, predisposing to exceptional, such as NDE-like, experiences (Timmermann et al., 2018).

Phenomenological cartography thus far

NDEs represent an especially intriguing phenomenon to study as they show a highly reproducible common core of features, and apparently superficial variations across cultural background (Athappilly et al., 2006; Belanti et al., 2008) and only a few features may alter with religio-cultural context such as the life review and the tunnel as being more a function of the modern west (Kellehear, 1993).

Foundational research

Heim (1891) was one of the first to collate experiential reports of those surviving brushes with death, including those after falling from heights (and so, in this case, not classical NDEs), after his personal experience of falling when mountain climbing, which entailed clear thoughts, slowing of time, no anxiety or grief, heavenly light and images from his whole life. Athappilly et al. (2006) synthesise the 15 features as originally constellated by Moody's (1975) *Life After Life*, based on 150 reports of persons experiencing a 'close brush with death' and interviews with 50 of these, which characterise the *near-death experience* (NDE), as it was then termed:

- (1) ineffability, difficulty describing the experience linguistically
- (2) hearing the news of their death from medical personnel, family, or others
- (3) overwhelming feelings of peace
- (4) noise, variously described as beautiful music or as unpleasant buzzing or ringing
- (5) a tunnel or dark enclosed space
- (6) a sensation of being out of the body, sometimes accompanied by apparent perception of the physical body from an external location, and sometimes accompanied by a sense of a distinct, non-physical body with different properties and senses
- (7) meeting nonphysical beings, sometimes unidentified but sometimes identified as deceased acquaintances or religious figures

(8) a “Being of Light,” often described as a loving entity manifesting as a supernaturally brilliant light

(9) a life review, sometimes under the guidance of the “Being of Light” and sometimes accompanied by a sense of judgment [often by the experiencer themselves]

(10) a border or limit demarcating the boundary between terrestrial and post-mortem life

(11) coming back, variously described as making a decision to return to life or as being sent back involuntarily [often with great reluctance]

[And those pertaining not to acute phenomenology, but after the near-death event:]

(12) telling others, and often receiving negative responses to recounting their experience

(13) effects on lives, often described as renewed focus on spirituality, increased appreciation for life, and love for others

(14) new views of death, specifically decreased fear of death and belief in post-mortem survival

and (15) corroboration, in which family and/or medical personnel verify the experiencer’s knowledge of events that was unlikely to have been acquired through normal perception.

Importantly, no single report included all 15 elements, no single element was featured in every report, and no invariable sequence was observed.

A more succinct phenomenology of the NDE, by combining Moody’s original (1975) and later (1988) characterisations, may encompass the following 12 ‘core features’: Sense of, or pronouncement of being dead; Feelings of peace; Unusual noises; Dark tunnel; Out of body experiences (OBEs); Meeting loved ones or divine beings; Light, often encountered as a being; Rising to the heavens; Panoramic life review; Border or Limit; Liberation from time and space; and Ineffability.

Measures and quantification of the NDE

Ring (1980) was the first to construct a scale to measure the near-death experience, the Weighted Core Experience Index (WCEI), where the progressively lesser reporting of each

stage is interpreted as representing increasing “depth”. Of 102 NDErs approximately 60% reported peace, wellbeing and absence of pain (Stage I), 37% reported a sense of detachment from the body, progressing to an out-of-body experience (OBE; Stage II), 25% entering the darkness or tunnel, including a panoramic memory, as well as predominantly positive affect (Stage III), 16% a bright, warm and attractive light, which may be perceived as or accompanied by a being of light (Stage IV), and finally 10% entering the light, entering transcendent realms, and meeting other persons or figures (Stage V). Final score ranges between 0-29, and the presence of each stage is representative of a ‘core NDE’ – however the scale is criticisable due to the arbitrariness of both the selected features and the proposition of levels of ‘depth’.

The Near-death Experience Scale (NDES) was developed by Greyson (1983) and widely used as the gold-standard measure to assess intensity (versus Ring’s arbitrary “depth”) of NDEs. Derived from 80 phenomenological features established in NDE literature, item-total score correlations yielded a final 16-item scale. The scale items differ to the features of Moody, in that the scale includes an additional ‘time speeding or slowing’, ‘thoughts speeding’, ‘understanding everything’, ‘harmony with the universe’, ‘vivid senses’, ‘extra-sensory perception’ or ‘precognition’, and entering an ‘unearthly world’; while the scale lacks Moody’s features of ‘ineffability’, ‘hearing the news’, ‘the noise’, ‘the tunnel’ and ‘coming back’. Importantly, all, including Ring’s, lack any indication of distressing or challenging experiences (detailed below).

Lange et al. (2004) evidenced that NDE score on the NDES fit a ‘Rash’ model, meaning it elicited a unidimensional measure which was scalable at intervals. As NDE intensity increased, peace and joy became more prevalent, followed by harmony, insight and other mystical-type experiences – where the deepest NDEs involved extra-sensory perception (ESP) and precognitive visions; that is, with increasing score, positive, mystical, and then paranormal items were progressively more likely endorsed, and the NDE scale components form a cumulative hierarchy. In order to explore whether a similar hierarchy may exist in qualitative NDE narratives, Lange et al. (2015) applied latent semantic analysis (LSA) to such reports, alongside the quantitative NDE scale. Those subjective reports associated with ‘true NDEs’ (above median NDE scale scoring) identified themselves as significantly structured episodes with a framework of 7 linguistic clusters – four of which centred around

paranormal or transcendent themes (e.g. Angel, god, float, voice), the rest vaguely denoting physiological or environmental specifics (e.g. Pain, shoulder, bed, door). The authors found strong support for the concurrent validity of the NDE scale, given the finding that the NDE intensity can be predicted from the clusters in each report.

Charland-Verville et al. (2014) identified in the largest statistical pooling of NDE studies employing the NDE scale, that the experiences occurring in more than 75% of classic (coma) NDEs included peacefulness, OBEs, a bright light and altered time perception, whereas precognitive visions and life reviews were the least common (under 30%). This generally seems to corroborate the aforementioned suggestions of greater depth or intensity of NDEs, which are more likely to be fewer, include such extra-sensory or life review features, as well as previous prospective studies including Parnia *et al* (2001), Schwaninger *et al* (2002) and van Lommel *et al* (2001). Similarly, Hou et al. (2013) also found intense light and pleasure (alongside helplessness) to be the predominant-most features amongst brain trauma survivors.

Finally, a newly constructed and improved measure, the NDE-Content (NDE-C) scale now includes several features not itemised in the NDES: Unusual sensory experiences, non-existence or void, entering of a gateway, sense of ineffability, decision or coercion to return, and indeed, feelings of being dead (Martial et al., 2020).

Qualitative analyses

In a Chinese study, Hou *et al* (2013), using Interpretative Phenomenological Analysis (IPA), seems to be the first to report on the NDE phenomenology of those having specific injury incurred to the brain (later further explored by Charland-Verville et al., 2015). Only 3/86 patients (4%) with severe brain injury (scoring >7 on the NDE scale, and with coma of >72 hours which correlates closely with fatality) were recruited, which may in part have been due to an inclusion criteria of amnesia duration of >7 days. All three subjects were Buddhist. The authors' categorical themes involved, description of the NDE, individual interpretations, and the impact conferred. Experiences of "Light" were the most richly described, subdivided into three domains. *Unique figures of light; Unique interactions with the light; Unique movement of individual with figure.* Intense, and ineffable, feelings of "astonishment" were

reported by all three, of “fear” by one experient, and of “pleasure” by another. A sense of “helplessness” was expressed by all three, wherein they had no control over, and could not escape their experiences. The experiences were both “supernatural” and “logical”, where one experiencer felt he was being warned of consequences of his unethical behaviour, and the deceased relative of another wanted to convey something about “the importance of spiritual activities for after-death lives”. “Differences in opinions on death” included one woman’s statement that “I now firmly believe that death is nothing but a transition of consciousness”.

These few brain trauma NDEs betray a lack of certain typical features, such as OBEs, tunnels or scenic environments. The process of ‘dying’ in itself is missing from this particular NDE aetiology, where time from blunt trauma to unconsciousness is minimal, compared to the progressive and more pervasive hypoxia of the brain in cardiac arrest. That is, high-frequency electrical surges and neurotransmitter flooding as characterised by Li et al. (2015) inducing cardiac arrest in rats, suggesting a possible programmed death-response, does not occur in brain injury – which may explain such comparatively shallow NDEs. Similarly, the lack of hypoxia would likely not disrupt the temporoparietal junction, nor cause excitotoxicity of the optic tract, both hypotheses for the missing OBE and tunnel effect (Blanke et al., 2004, 2015). Such complex hypoxia-induced neuronal activity has been modelled in artificial neural network (ANN) simulations, further suggesting such conditions as necessary to provoke such elaborate experiences (Prakash et al., 2009).

Cassol et al. (2018) conducted a thematic analysis of 34 cardiac arrest survivors, all were recruited through either a French or Belgian organisation, including 23 males, of a mean age at NDE of 49, and range of NDE score of 7-22, exact ethnicity or religious orientation were unfortunately not provided. Ten “time-bounded” themes, and one “transversal” theme were ultimately identified. The themes extracted were reported as follows (with frequency of NDEs in brackets): Light (25) which was typically white, intense, attractive, and coming from a tunnel or corridor, or from everywhere, and sometimes ineffable; Meeting/Encounter (15), with “human or imaginary” beings, usually within the light, or less commonly by a river, or even an office, typically visually witnessed, and sometimes telepathically communicating, and who were human beings, mostly deceased (either family members or unknown, the frequency breakdown unfortunately not cited) or (4) non-

humans (though their form undescribed); Hyperlucidity (14), involving mostly heightened cognitive capacity, as well as absolute understanding, sometimes associated with feelings of omnipotence – this is highly reminiscent of the noetic element of the mystical experience, where 3 NDErs interestingly link this hyperlucidity with being “united with everything that surrounds them”, that is the unitive experience, and 7 either describe their wellbeing (akin to bliss of the mystical state) or ineffability here; Description of scenes (14), many stating its ineffability, sometimes a natural environment or simply infinite; Darkness (13), an apparently unanimously empty and inescapable environ, but alternately absolute dark, gloomy, a tunnel or waiting room, in 7 cases prior or after a bright light; OBE (12), most witnessing the emergency situation and half from a high position (many of whom claim corroboration of their vision), and some physically feeling their bodily de- or re-attachment; Awareness of death (9) – only 9 of 34 (expressly) reported an awareness of their dying; Life events (8), life being reviewed in most instances and relived in a minority, the episodes being “selected” in 1 case, and in 1 case was actually a “future life” (though not clarified if a ‘life preview’ or one’s *next* life) – which was not linked with empathy with those observed, nor was a ‘panorama’ mentioned; Altered time perception (transversal theme; 16), half stating a loss (or transcendence) of time, and fewer a dilation or total cessation; Entrance to the NDE (6), half being gradual, and two in fact first prefaced by a “period of dark night”; Return from NDE (19), mainly comprising either a message leading to, or direct ejection from the experience, as well as a distressing tearing away from their prior state, and two being “brought back” presumably by some agent.

As regards emotional valence, astonishment, amazement or surprise were often reported by NDErs usually describing the mystical-like state of hyperlucidity as well as the otherworldly scene they found themselves in. Strong feelings of wellbeing were associated with almost all themes, especially hyperlucidity, the light, OBEs and awareness of death – whereas fear or other negative emotions were less common, linked mostly with the return, as well as darkness, viewing one’s life, the encounter, and the witnessed scene (though all also linked with pleasurable sensations).

A particular problem with one of the authors’ conclusions, that their results replicating the majority of established research into NDE phenomenology suggests “NDE testimonies from all around the world show sufficient commonality to consider NDEs as universal human

experiences” (p. 10), is that their own analysis and the literature to which they refer is overwhelmingly from white Western research programs. Some limitations acknowledged include the self-selection meaning possible over-representation of positive narratives, with such retrospective design meaning possible memory alteration – as Charland-Verville *et al* (2014) show some features as more common retrospectively, although Greyson (2007) showing memory consistency over time – which calls for the need for prospective studies. Authors also note the need for rich narratives best served by semi-structured interviews, versus the written narratives their study used – not least to explore how this typically “ineffable” experience is articulated. Most importantly, they highlight that quantitative scales cannot distinguish between NDEs of different aetiologies, nor NDEs and NDE-like experiences, that is those without threat to life, including psychoactive drug experiences (Charland-Verville *et al*, 2014), where qualitative analyses would be ideal for such a future research program – such as that at the core of the present thesis.

Charland-Verville *et al.*'s (2020) text mining analysis of NDE narratives included 158 NDEs, 53% female, mean age (at NDE) 35+-17, with aetiologies ranging from anoxia (e.g. cardiac arrest, drowning) 34%, trauma (e.g. vehicle accidents, falling) 19%, other medical (e.g. surgery, illness) 41%, and “NDE-like” (e.g. sleep) 0.07%. Mean narrative length was only 140 words (range: 13-1592), and the 30 most-reported features were extracted, and emerged within 3 semi-distinct clusters. These were as follows – The first cluster: See, Light; Second cluster: Well, Body, Love, Felt, White, Life, Consciousness, Time, Nothing; Third cluster: Tunnel, Sensation, Eyes, Say, Moment, Persons, Knew, Impression, Black, Remember, Bed, World, Feeling, Fear, Experience, Dead, Think, Space. The authors summarise that each cluster is progressively less correlated with the subsequent, meaning that, for instance, “light” appears more often with “love”, but less often with “fear”; or “see” appears more often with “well”, but less often with “dead”. The first cluster, apparently of a visual nature, see & light, is more strongly associated with the second cluster, which is seemingly characterised by positive feelings or highly abstract constructs (e.g. love, felt, consciousness, time), as opposed to the third cluster’s mainly visuo-spatial or cognitive components (e.g. tunnel, eyes, think, remember) which were also less positively charged (e.g. black, fear, death) – and were themselves also less common.

The word “dead” occurred only in 18% of cases, one of the least reported, which may refer to themselves or indeed impressions of deceased others. The word “remember” could possibly refer to the life review feature, which emerged 23% of the time as the 11th least common – and has been identified as one of the least common features in several other studies (e.g. Charland-Verville *et al*, 2014). Similarly, “fear” transpired in 24% of cases, where, though its extent unclarified, a quarter of experiences is significant given both the NDE scale and WCEI do not list such an option and thus under-representing its occurrence. Again likewise, “tunnel” appears in 35% of reports, yet this is not featured on the NDE scale. 45-67%, the most common, span the words “light”, “body”, “felt” and “time” – which interestingly connect intimately with the most reported features as found by Charland-Verville *et al* (2014) i.e. Light, OBE, peaceful feelings, and time distortion. 30%, almost a third, involved the word “love”, where indeed, particularly associated with the light (as indicated above) and the beings (often portrayed as beings of light), the experience of love is a corner-stone facet, especially unconditional love (e.g. Greyson, 2006).

A key limitation of such text analyses is of course decontextualization, whereas qualitative analyses are not undermined in this way, and provide far richer pictures, such as Cassol *et al* (2018). Indeed, while the authors state novel extractions were “tunnel”, “love” and “fear”, although not apparent in the NDE scale, tunnel and fear were clearly included in Cassol’s study, and tunnel and love were emphasised in the original descriptions by Moody (1975).

Relatedly, there is a misleading trend in research showing NDEs to be vastly positive in nature, with a paucity of studies specifically exploring so-called “distressing” or “negative” NDEs. Charland-Verville *et al* (2014) showed 10% of their sample similarly did not report positive emotion, 2 of which were described as explicitly negative. Peinkhofer *et al.* (2019) in a review of the near-death experience literature between 2014-2019 including 42 research papers, identified positive NDEs to be recorded more often – 11/13 papers (86%). Negative NDEs, including fear and distress, were noted in 5 studies, where prevalence ranged from 1-9% – which were more common during childbirth complication, surgery, trauma, suicide and infratentorial lesioning.

Greyson & Bush (1992) examined the narratives of 50 NDEs, developing three subcategories of such distressing experiences: i) NDEs appearing comparable to other NDEs yet are reported as unpleasant (corresponding to Ring's 1984 “inverse” experience), the

commonest of the three ii) NDEs involving the experience of being entirely alone in a seemingly eternal “void” iii) “hellish” NDEs involving hell-resembling environments populated with demonic beings, the rarest of the three. Elaborating on the Inverse type, the gross features themselves are comparable to those in positive experiences, but the distinct perceptions are conflicting – for instance, the deceased spirits are wandering, restless and desperate and the bright light is perceived as a collision, or the void, while sometimes experienced as full and tranquil, is instead empty and terrifying (Peinkhofer *et al*, 2019). Cassol *et al.* (2019) investigated 123 NDEs, albeit all induced by a specific etiology, severe brain injury, finding 14% (17) to report negative emotional experience (via the Memory Characteristics Questionnaire). 8 Hellish NDEs, 8 Inverse NDEs, and 1 Void NDE were identified overall, substantiating Greyson & Bush’s classifications, though with the Hellish type being as likely as the Inverse. However, they do not seem to state that this may be largely owing to their coding being seemingly predicated on Greyson & Bush’s original categories. Rommer (2000) for instance posited a fourth variant in which the NDEr experiences a life review involving feelings of being negatively judged by a higher being – a theme which Cassol *et al* did identify but (again in reference to Greyson & Bush’s criteria) demarcated as ‘hellish’.

Overall, the ubiquitous use of the NDES might mislead into interpreting these more emotively complex NDEs as only enjoyable. Previous literature suggested frequencies of distressing NDEs between 1-10%, notably lower than Cassol *et al.* Other than the improved methodology of the authors’ paper, the most obvious reason for this is the more recent growth of acceptance of NDEs and thus willingness to report even those with distressing dimensions. Given the sample to have been self-selected though, it is likely that a 14% prevalence is still under-representative, as distressing NDErs would be less willing (or able) to report them.

Near-death experiences, Fear-death experiences or NDE-like experiences

Heim (1891) represents one of the first systematic collections of NDE reports, obtained from mountain climbers experiencing *non*-fatal falls (and thus sometimes dubbed ‘fear-death experiences’), thus suggesting the powerful role of psychological reactivity to perceived threat to life. Charland-Verville *et al* (2014) compared the NDE scale score and reported

features of NDEs between NDEs associated with non-life threatening events i.e. “NDE-like” (including sleep, drug consumption, grief, Cotard’s syndrome, meditation, epilepsy and syncope – however, these last two may still involve significant insults to the brain), and NDEs associated with coma of different aetiology i.e. “real NDEs” (including anoxic, traumatic, and non-traumatic for instance surgical complication). Fascinatingly, the authors found no significant differences in either depth or features of NDEs between the groups, nor between different causes of coma; as such suggesting a high degree of similarity of NDEs regardless of whether actually proximal to death, and an apparent lack of necessity for overt brain injury. Critically however, this may just as equally suggest failure of sensitivity of the NDE scale to resolve between these aetiologies and conditions.

Several researchers claim that only sufficient belief or fear of dying may be the primary determinant for eliciting an NDE, given limited observable differences between experiences with and without threat of death (Gabbard et al, 1981; Gabbard & Twemlow, 1991; Stevenson et al., 1989). Yet many NDE aetiologies, while not technically life threatening, still do not entail any such belief or fear, such as during meditation or sleep. This said, nightmares may certainly incorporate such fear of death and the hypnogogic state may echo dying, and some meditations are expressly directed to NDE-type experiences (van Gordon et al., 2018) so suggestion effects of dying may still occur.

In contrast with Charland-Verville’s findings, Kelly (2001) also using the Greyson NDE scale, reported individuals experiencing real NDEs more often encountered deceased relatives, which were in turn more frequent when the causative condition was traumatic brain injury or cardiac arrest (as compared with childbirth complications) – mirroring van Lommel *et al* (2002)’s finding deceased persons to be the second commonest amongst cardiac arrest NDEs. Owens et al. (1990; though not using standardised scales) found that 96% of patients near death and 84% of patients not near death (identified by medical records) believed that they were near death or indeed dead. Real NDEs were significantly more likely to include a bright light and enhanced cognition, the latter being of note given the supposed ‘dysregulated’ brain-state. Whereas those *not* near death showed comparable ratings for positive emotion, OBEs, tunnel perceptions and memory flash-backs. As such, these latter experiences may not rely on distinct physiological changes approaching death, but are elicitable via the conviction of dying alone, despite several posited explanations for each

based on dying brain activity. Gabbard & Twemlow (1991) conversely reported real NDEs to more likely entail OBEs.

Van Lommel *et al* (2002) report there to be no correlation between duration of cardiac arrest or unconsciousness, intubation or medication, nor fear of death, knowledge of NDEs or religion and NDE incidence. Also suggesting limited psychological influence of expectation, is that NDEs not only occur, but are more common in young, unenculturated children (M. Morse *et al.*, 1986) – though neuro/psychological characteristics unique to the young may likely contribute – and sometimes entities appear which are unidentifiable to the NDE experient (e.g. belonging to other traditions) – though these are often without content. Several NDE features have been demonstrated in cases lacking both proximity to death *and* without belief in impending death, in which neither expectation nor neurobiological accounts may be readily applicable, for instance when reproduced via hypnosis (e.g. Schenk, 1999) – though hypnosis is vulnerable to suggestion, and the phenomenology itself echoes NDEs. Van Lommel (2010) similarly summarised other NDE-eliciting contexts seemingly without either, such as isolation, depression, existential crisis – though each of these share certain qualities with the state of death or dying. Moody & Perry (2010) also note the ‘shared death experience’ in which a dying person’s NDE is experienced by one not close to, albeit confronted with, death. Other psychological variables may engender NDE-like episodes in contexts lacking even fear or expectation of death, such as fantasy proneness as correlated with intensity of such NDE-like experiences (Martial *et al.*, 2018).

Van Gordon *et al* (2018) investigated another example of ‘NDE-like’ experiences, that of ‘meditation-induced near-death experiences’ (MI-NDEs), referred to in ancient Buddhist text, in 12 advanced Buddhist meditators (83% male). Reported MI-NDEs exhibited an NDE scale score of a substantial 24-30 (of maximum 32), significantly higher versus control conditions not inductive of an NDE, where the MI-NDE also yielded significantly greater pre-post increases in profundity of the NDE and mystical experience and non-attachment compared to the controls. MI-NDE profundity also significantly increased over a 3 year period.

Semi-structured interviews and thematic analysis revealed 4 master and 6 subordinate themes. ‘Identification with elements’ involved a conscious disconnection with the body, and a “becoming united”, corresponding to visions of the unbinding of the ‘bodily

elements'. 'Altered perception of time and space', the next phase, entailed the realisation of time and space as relative, illusory phenomena. All 12 subjects, in their latest or previous MI-NDEs, reported visions of their own, this world or other worlds' past and future (including past lives). 'Non-worldly encounters' followed, encompassing hellish or torturous realms ("hungry ghost realms"), realms of humans and animals, realms of light-beings ("heavens" or "godly realms"); as well as non-worldly beings, including the recently deceased, demonic beings, unbounded, liberated being (such as subjects' Buddhist teachers). 'Emptiness' describes the richly contentful accounts being referred to as the nature of "voidness", that is empty of inherent existence, and "a projection of the mind". 'Awareness of the physical body', included the retention of distant awareness of their body, such as "leav[ing] a small thread you use to remain in contact [with it]", where allocation of attention to bodily experiences would interfere with the unfolding MI-NDE. 'Awareness of NDE and Non-corporeal form' describes the full awareness of and control over their MI-NDE, including a bodily form which possessed special abilities such as flying through walls, translocation or superposition. 'Voluntary control' meant voluntary induction or termination of the MI-NDE and the selection of realms and beings. 'Spiritually meaningful insights' included those into death-related processes, discovering "gifts of wisdom", sometimes "placed in their mind" by spiritual teachers.

Apart from how MI-NDE and normal NDEs may be resonant, they can also be distinguished by the former's *additional* features of awareness of the body, experiences of past lives (versus only the more classic 'life review'), as well as volitional control, paralleling the MI-NDE with experiences of practiced lucid dreamers – such as dream yoga practitioners of Tibetan Buddhism, to which this MI-NDE practice is linked – but importantly, meditators' additional *interpretation* of the experience as either of emptiness or mental projection, starkly contrasted to virtually all NDErs describing the state as 'more real than real'. Given their 'NDE-like' category, this implies the generative capacity of one's psychology to precipitate NDE-like states without physical brain trauma. Relatedly, the MI-NDE could be regarded as a form of elaborate priming, being predicated on documented ancient meditation techniques, as reported in Van Gordon *et al's* (2018) methods, for the induction of a death-state, from which the practitioners learn about which experiences to psychologically cultivate.

This is an important phenomenological study into *consciously* induced and controllable NDEs, which (as with other NDE-like states, such as DMT) offers a unique opportunity for experimental research on reliable models of NDEs – for example, *in vivo* real-time brain imaging, which would be ideally combined with qualitative interviewing with a view to a ‘neurophenomenological’ research program in which subjective effects are closely correlated with neural correlates, impossible with spontaneous NDEs.

Structural sequence

Martial et al. (2017) endeavoured to identify if there is any distinct temporality in the order in which experiential features of NDEs unfold. 11 time-bound and 5 diffuse features were collated from previous NDE literature and identified, using qualitative text analysis, within 154 French (82% female, 34 average age) NDE narratives, apparently of any aetiology including ‘NDE-like’. They found that in all narratives, the most frequently reported features were peace (80%), bright light (69%), encountering spirits/people (64%), while the least frequent were speeded thoughts (5%) and precognition (4%) – which is almost exactly in line with previous research (Charland-Verville *et al*, 2014), especially peace as commonest and precognition as least common (e.g. Greyson, 1990, Schwanger *et al*, 2002). That no one feature is universally experienced is also consistent with previous research.

Regarding the temporality – while constituting only just over half of the total features, though spanning all 150 narratives, an approximate order of appearance was garnered to be initiated by peace, then light, followed by spirits or people (mirroring the commonest found in this study) and finally the border and return. Largely, a robustly repeated chronological sequence of NDE features was not found, indicating that most NDErs would experience a relatively unique pattern of features. However, when looking to only 4 features (36% of total features), which were also all found in 27 texts (~18% of total texts) – 6 texts (22% of texts with these features, but 4% of *total* texts) showed these 4 features in the following order: OBE, a tunnel, a bright light, and feeling of peace. This very closely maps onto the commonest NDE features as shown in another study (Charland-Verville *et al* 2014): Peace, OBEs, light (as well as time dilation and deceased relatives). That is, it appears the most common experiences, which are also most likely the shallowest as only a minority

experience particularly 'deep' NDEs (Ring, 1980), appear to be the only features which end up occurring in a specific sequence.

That OBEs were the commonest feature at the NDE's beginning, the authors suggest, could mean that NDEs are triggered by a sense of detachment from the body – likely implying a mechanism in which a cascade of further experiences ensue upon the psychological prime of externally witnessing one's life-threatened body. However, the causative direction may be otherwise, where the common OBE initiator may well reflect a *neural* cascade when approaching death starting with, for instance, anoxia-induced seizure-like activity near the temporoparietal junction (as similarly discussed by Blanke et al., 2015). The authors, albeit briefly, note that the order in which the narratives present their features may well be less a function of the experience *per se*, and more a retroactive (*a posteriori*) function of its articulation for the purpose of coherence – especially given the significantly altered perception of linear time in NDEs (reported in the current study at over one third), and, relatedly, its reported ineffability.

Cultural construction

Long & Long (2003) compared NDE accounts *transpiring* both before and after the publication of Moody's seminal 1975 work and popularisation of the NDE narrative, finding that there were virtually no differences. However, all their included accounts were *reported* after 1998, leaving them vulnerable to potential memory bias and elaboration due to the propagation of NDE-related memes. To more thoroughly explore the impact of such a prevailing model of the NDE, Athappily *et al* (2006) compared NDE accounts which were collected i.e. reported pre- and post-1975. 24 pre-1975 accounts were matched with 24 post-1975 accounts on age at time of experience, gender, race, cultural background, religion, causing condition and closeness to death (both groups were predominantly female, Caucasian, European and Christian), and rated in reference to Moody's 15 features by two independent researchers. Interestingly, none of the features were found to be significantly different between groups – with the one exception of the 'tunnel' experience, which was significantly more common *post-1975* versus before ($p=0.002, <0.05$) – meaning it may only be this feature which has been artefactually implanted into NDErs' scheme of expectations.

Drab (1981) described this tunnel phenomenon as a 'secondary hallucinatory mental creation', and Chari (1982) highlighted that it is by no means unique to NDEs but a common motif in very many altered states, not least psychedelic states. Consistent with this, Greyson (1983)'s factor analyses of the NDE scale encouraged a removal of the tunnel feature due to not differentiating NDE depth – however, being in 1983, many reports used may have been collected (and likely most experienced) prior to 1975, meaning the tunnel (as the present study suggests) would have been less reported. Some authors such as Kellehear et al. (1994) suggest it to be a Western culture-bound phenomenon, though not explaining its absence pre-1975 – and others have posited physiological mechanisms (e.g. Blackmore, 1993, 1996), though not congruent with its increase post-popularisation.

Intersection with the Mystical experience

Noyes & Slymen (1979) conceptualised three successive stages through which one goes approaching death: resistance, surrender (and life review), and transcendence including classic mystical features such as joy, unity and noetic experiences, and Pennachio (1986) identified all six classic mystical elements designated by Stace (1960) in NDE accounts – which comprised of (1) sacredness, (2) noetic quality, (3) deeply felt positive mood, (4) ineffability, (5) paradoxicality, and (6) transcendence of time and space. However importantly, NDEs may be differentiated via their emphasis on personal content, such as the life review and meeting deceased loved ones, and crucially the dualistic narrative arc missing in the core mystical state (some also claim greater lucidity and lesser unitive experiences in NDEs; Wulff, 2000). The two phenomena should neither be considered virtually the same nor mutually exclusive (Marshall, 2005), where NDEs could be considered mystical-type experiences which are initiated by the specific context of being near (or fearing) death. That is, mystical experiences have no single criterium for trigger (producible by meditation, drugs, TLE etc, *and* dying), and are determined only by their composite characteristics.

Greyson (2014) applied the mysticism scale and NDE scale to 292 subjects (predominantly American Christian) reporting NDEs and 34 not reporting NDEs, both after life-threatening situations. 66% of NDErs qualified for a mystical experience, while 7% did not, where depth

of NDE was strongly correlated with that of mystical experience and all categories therein ($p < 0.001$), especially those of noetic, positive affect and unity. Although several NDE scale items correspond to mystical features, upon their removal to reduce tautological correlation, the NDE scale still significantly correlated with the mysticism scale ($p < 0.001$). However, a factor analysis of combined non-overlapping items from both scales identified two factors; Factor 1 with 15 of 16 items from the mysticism scale (thus representing a “mysticality” factor), and Factor 2 with 10 of 11 items from the NDE scale (thus representing a “NDE”-type factor). Greyson lists items preferentially loading to the NDE factor to be those most associable with death or dying i.e. the life review, border of no return, and deceased/religious spirits – however, those most significantly loading to the NDE factor were encountering deceased/religious spirits (0.57) or mystical being (0.66), and vivid scenes (0.62) or unearthly realm (0.50), which are better conceptualised as those directly associated with dualistic interaction with an “other” (other worlds, or beings), contrasted to the non-dual mystical state, undriven by content. Therefore, NDEs can in this way be readily distinguishable from mystical experiences.

Mean mysticism scale scores of NDErs were additionally shown to be markedly lower than those reported after high-dose psilocybin experiences, although they were comparable to low-dose psilocybin (Griffiths et al., 2006). This said, extensive support and expectations of profound experiences to optimise the well-known influential effects of set and setting were given prior to these drug sessions, versus the total spontaneity of NDEs, and the mysticism scale was given directly post-experience, versus the mean 34 years post-NDE in the present study (where time elapsed negatively correlated with score).

Griffith *et al*'s (2006) aforementioned, landmark study demonstrated psilocybin's occasioning of mystical experiences which were “similar to spontaneously occurring mystical experiences” (p. 268). The near-death experience could in this way be considered a type of naturally-occurring mystical experience, possibly influenced by the endogenous serotonin system. The psilocybin mystical experiences were rated by a majority as being amongst the most spiritually significant experiences of their lives, sustained at 14 months (Griffiths et al., 2008) – another comparability with the NDE's persistent spiritual after-effects (Greyson & Khanna, 2014).

DMT May Simulate the Phenomenology of the NDE

There is a deep historical relationship between psychedelics and death. The Amazonian shamanic decoction Ayahuasca, containing DMT, means “vine of the dead” or “vine of souls”, and the *Tabernanthe iboga* root-bark, containing ibogaine, a ketamine-like dissociative psychedelic with effects lasting for up to 72 hours, is used by the West African indigenous to induce a ‘death trance’; and ‘Mictlan’, the name for the Aztec underworld, was also the name given to vast desert spaces in which the peyote cactus, another entheogen employed by small-scale societies of the Americas, was known to grow (Shushan, 2009) – all of which are harnessed for ancestor communication. Szara, the first to administer Dimethyltryptamine (DMT) to human subjects in 1958 documented several experiential reports, one being particularly redolent of the NDE, involving feelings of dying, beneficent gods, and light. The spectre of death was present from the birth of the prototypical psychedelic, LSD, in the contemporary West when Hofmann, LSD’s synthesiser, deliberately took almost 3 times the regular dose in history’s first acid trip, and was convinced he was dying after hovering above himself in an out-of-body experience (*High Times*, 2020). Similarly, the near-death-like nature of LSD sessions during early psychotherapeutic administrations have also been observed (Grof, 1994). Leary and colleagues’ (1964) *The Psychedelic Experience: A Manual Based on the Tibetan Book of the Dead* chartered the experiential phases navigated within the psilocybin state, another serotonergic, paralleling them with the post-mortem ‘bardo’ stages of the Tibetan *Bardo Thodol*. Again, foreshadowing of Moody, “close-to-death experiences” was a term coined by Lilly (1972) when framing his personal experiments with sensory deprivation and later ketamine – and it is of note that Moody (1975) himself in his seminal book juxtaposed classical psychedelic and near-death experiences, also mentioned by Hampe (1975). This following review segment shall outline the major literature with significant bearing on the inter-relevance of the phenomenology of both the DMT and similar psychedelic experience and the dying or near-death experience.

Cursory comparisons

Potts (2012) makes the argument, though based on only a paucity of arbitrarily selected features from the rich diversity of both DMT and NDE experiences, that the most compelling

reason against the DMT hypothesis of NDEs (indeed against that of any drug theory) is that the experiences are far more dissimilar than they are similar. Of the 16 items of the Greyson NDE scale, he only highlights 6 to also occur during DMT states (though no comparator dataset of DMT experiences is offered): Sudden understanding, light, sensory vividness, OBEs, unfamiliar environments and religious/deceased spirits. This is a distinctly erroneous claim, where though the entire task of the present thesis is to analyse in much more significant depth and breadth this precise phenomenological comparison, it should be noted at this stage that on the basis of literature *all* NDE scale items can appear under DMT. The only features less likely to, however, may be limited to ‘thought acceleration’, ‘border of no return’, ‘life review’, and ‘extra-sensory perception’ (Timmermann *et al*, 2018). Though, the latter two are consistently the least frequent within NDEs also (Charland-Verville *et al*, 2014), and in this way DMT and NDEs are comparable. An apparently self-constructed 24-item shortlist of Strassman’s (2001) reported DMT experiences was in turn compared to NDE phenomenology (albeit again, with no systematic comparison to any NDE corpus), where Potts only selects the following as similar to those in NDEs: Taj Mahal-like buildings [where complex otherworldly edifices/cities are sometimes reported in NDEs, while the transcultural nature of them is more likely in DMT], vivid colours, impersonal beings, angelic singing, feeling loved, gaining information, a great power behind all things, noetic quality, bright light and separation from body. Here he is more accurate, where only 10 of 24 are noted as experiences common to both, implying a wealth of elements which are native to the DMT state but not of NDEs – such as, DNA spirals, computer or machine-like imagery, clowns or circus-like imagery, surgical procedural scenarios, insectoid/reptilian beings, video-game stick figures or raping crocodiles. Ego loss is also included here, though this is certainly presentable in NDEs.

Potts notes a final similarity that DMT experiences may involve demonic-type beings, which are in this way comparable to, specifically, distressing NDEs which are in the minority (Bush, 2009). However, DMT reports, he notes, do not include travelling to other worlds via tunnels, veridical OBEs, and rarely the after-effects typical after NDEs. In this he is again only correct regarding veridical OBEs which do appear rare with DMT – however, tunnels are certainly reported (e.g. Leary, 1966), and profound personal and ontological shifts are common after breakthrough DMT experiences (e.g. Davis *et al*, 2020). Potts concludes,

appropriately, that DMT may well play a role in NDEs, but the evidence is not strongly in its favour. Indeed, multiple neurotransmitter systems and neural regions must be recruited, and DMT is neither the only nor the chief mechanism in the production of NDEs.

Liester (2013) similarly to Potts, compared Moody's 9 NDE features to Shanon's (2002) detailed descriptions of, not pure DMT, but ayahuasca, arguing that 8 of the 9 are also shared with ayahuasca experiences: Sense of being dead, peace, OBE, tunnel/void, people of light, beings of light, life review, rising to the heavens. That is, all except the 'reluctance to return to life', including reaching borders, which may be partly due to the lack of genuinely nearing death – though such reluctance is not uncommon with ayahuasca. Later Liester clarifies that ayahuasca OBEs are very atypically those involving autoscopy as in NDEs (though, the shamanic 'soul flight' as in ayahuasca may similarly occur in otherworldly, iconic NDE scenes). One distinction that he does not make, however, is that while experiences of darkness may be encountered in both, the form of dark tunnels characteristic of NDEs near their onset and typically transmigrating the experient elsewhere is not common to ayahuasca.

He then systematically takes Shanon's perceptual, visionary, emotional, cognitive and transcendent breakdown of ayahuasca phenomenology, comparing them to Moody (1989) descriptions as well as several published authors' personal NDE accounts. Beginning with mostly deviating experiences between the two: In respect to perceptual or visionary elements – hallucinations as described by Shannon, namely geometric patterns, are distinctly absent from NDEs; most elaborate variants of ayahuasca beings (e.g. mythological or extra-terrestrial creatures) are not found in NDEs, though 'angels', 'beings' or 'orbs of light' are common descriptors in NDEs (Alexander, 2012; Brinkley, 2008; Ritchie, 1978; Storm, 2005), and the guiding/reassuring, teaching or guarding functions are carried in both (Moody, 1975); demons or monsters are only found in the minority of distressing NDE reports (Storm, 2005); mathematical formulae are barely observed in NDEs (though symbols are possible, as Ring, 1984 describes a case of the appearance of Greek letter Psi). In respect to emotional and cognitive elements – fear and distressing experiences are reported in 23% of NDEs (Bush, 2009); and while Liester did not list synchrony and syntony to be shown in NDEs, phenomena of extra-sensory perception, especially potentially veridical OBEs or clairvoyance, are known to occur in NDEs (e.g. Holden, 2009). Other features native to

ayahuasca but not NDEs included jungle-related themes, X-ray vision, and eyes and faces. Deceased loved ones are also listed as common to NDEs but not ayahuasca, which is quite incorrect given the very shamanic usage of the brew to occasion ancestor communication.

Common to both ayahuasca and NDEs however, Liester encompasses most of Shanon's descriptions: Regarding perceptual or visionary elements – hyper-reality (Moody, 2012); sensory hyperacuity, such as 360 degree vision (Moorjani, 2012); hearing beautiful music (Alexander, 2012; Piper, 2004); life review/autobiographical content (Brinkley, 2008); visions of, often natural, landscapes (Alexander, 2012); 'extra-terrestrial travel' like journeying through space or over the earth (Jung, 1989); remarkable cities, specifically those made of light (Brinkley, 2008; Ritchie, 2007); though perhaps more exaggerated and easier to identify in ayahuasca, archetypal imagery is replete in both (Jung, 1989). Regarding emotional and cognitive elements – ecstasy and joy; deep peace, including healing; love, especially as emanated by the beings of light are typical of most NDEs (Moody, 1975); personal and interpersonal insight, especially telepathic-type experiences or during life reviews with NDEs (Moorjani, 2012); instantly intuitive knowing (Alexander, 2012; Jung, 1989); cosmic consciousness experiences of merging with a deep interconnected reality at the basis of existence (Alexander, 2012; Moorjani, 2012); access to complete universal knowledge (Moody, 1983). All 7 of Shanon's transcendent experiences are finally reported as found in both experiences – unity and boundary-dissolution (Alexander, 2012); transcendence of space-time (Jung, 1989); noetic experience (Alexander, 2012); intense joy or blessedness (Moody, 1975); sacredness, usually in connection to the beings of light and their religious conceptualisations (Moody, 1975); paradox resolution is not expressly evident in NDEs (though Liester notes the similarity with realising one's death despite continuation, indeed enlivening, of consciousness); and finally, abject ineffability (Moody, 1975; Alexander, 2012; Jung, 1989).

Liester concludes that, citing Strassman's original hypothesis of DMT-mediated NDEs, ayahuasca and NDEs share numerous phenomenological overlaps which warrants further research. However, though not providing a citation, Liester (2013) writes that Strassman eventually abandoned his proposition of pineal DMT as responsible for inducing the NDE when he observed that themes of death and dying were infrequent during DMT sessions.

This said, Liester notes many NDErs do not initially associate their experience with death or dying either (e.g. Ritchie, 2007).

DMT models the NDE

Most lately, Timmermann *et al* (2018) constitutes the first investigation of DMT administration to humans in over 20 years since Strassman's work. The study took a more systematic, psychometric approach to address this parallel, by applying the present gold-standard to measure NDEs, Greyson's NDE Scale (Greyson, 1983). Thirteen healthy participants (mean age 34, SD: 9 years; 6 female) were given 7-20mg I.V. (3x 7mg, 4x 14mg, 1x 18mg and 5x 20mg) in a single blind, placebo-controlled design. Direct comparisons of results on the NDE scale were made with a gender and age-matched sample of near-death experiencers (via life-threatening episodes; mean time since NDE: 7 years, SD: 6). Findings included that all DMT experiencers qualified for experiencing an NDE, where 15 of 16 items on the NDES scored higher under DMT versus placebo. Significant correlations were observed for both the Ego Dissolution Inventory (EDI) and Mystical Experience Questionnaire (MEQ) with NDE scale scoring, suggesting a marked relationship between such states. Critically, total NDE scores after DMT are highly comparable to those of the 'real' NDErs ($p = 0.089$, Cohen's $d = 0.49$), and all 16 items of the NDES were insignificantly different between groups – except for the feature of 'coming to a border or point of no return'. This feature was significantly higher in the NDE sample, which is particularly notable given its quintessential association with the finality of death, where distinct differences in expectation and circumstance may have driven this differentiation. This said, it did not survive multiple comparison correction – however, Bonferroni corrections were used, which may be argued to be overly conservative and promote false negatives.

Of interest, 6 NDES items (after corrections) under DMT were especially low, not being significantly different to placebo, such as ESP, precognition, increased speed of thought and the life review, which are all also reported to be less commonly featured in NDEs (Schwaninger *et al*, 2002; Greyson, 2003 – see especially Charland-Verville *et al*, 2014), and in this way the states are comparable. Deceased or religious spirits and coming to a border, on the other hand, were also similar between DMT and placebo – where the border is

usually marked in real NDEs, and spirits being in fact one of the most reliable NDE features (Charland-Verville *et al*, 2014), and so in this way the states are distinguishable.

The NDES and MEQ correlation may in part be owing to very comparable items within each, where Timmermann *et al* regrettably didn't omit such overlaps – though Greyson (2014) did remove the similar items and still found high correlation, and several differences are also present including separation from the body and encountering beings or presences in the NDES. Not only can such overlaying mystical experience act as one central phenomenological bridge between psychedelic or DMT and NDEs, but may also likely be one substantial reason for the mutual, sustained after-effects and improved wellbeing.

Importantly too, that the study found absorption to predict intensity of DMT-induced NDEs, as has been found with intensity of real NDEs previously, and coupled with the fact that this trait is linked to a genetic polymorphism in the 5HT-2A receptor (Ott *et al.*, 2005), indicates that the near-death experience may well be significantly contributed to by the serotonin-system. Thus, further supporting a biological role for endogenous psychedelic-like compounds near-death, as well as a phenomenological simulation by them. Regarding the present study's finding DMT-induced NDEs' to correlate with delusional ideation, past research has similarly found that 'fantasy proneness' is strongly correlated with the NDE, specifically in "NDE-like" experiences i.e. those with *no threat to life* (such as meditation or distress; Martial *et al*, 2017) – which marries well with the present findings in a context of NDEs induced artefactually via a psychedelic drug. Although certain personality traits were successfully predictive – irrespective of much research concluding contextual factors as influencing of both psychedelic and NDE states, this study identified no differences (via the NDES) between the two despite extremely different expectational and circumstantial arrangements. This could argue against such factors being instrumental to any phenomenological differentiation, although the basic features as measured by the scale are likely not sensitive to such psychological variables, which otherwise influence their subjective variation. This is a crucial point linked to the following limitation.

The key caveat with such a psychometric approach as that taken by Timmermann *et al* (2018), is that such 'sameness' in terms of scale-items, equivalent to the very superficial features of the NDE which constitute the overall syndrome, is entirely neglecting of the myriad ways in which said features can manifest. That is, the specific 'content' may be very

idiosyncratic between persons, let alone between inducers of the experience, where the phenomenological 'structure' may be stable. This employment of questionnaire thus only discerns DMT's crudely modelling the NDE, and that as opposed to "NDE-ogen" (Thomas, 2004) which suggests complete engendering of the syndrome, DMT may only occasion a superficial, albeit reliable, simulation of the NDE picture. Extensive qualitative analyses of the present thesis are better poised to determine the likelihood or degree of DMT's potential role in the near-death experience. One further limitation includes only a minority of subjects receiving high-dose, where had all 13 received 20mg, DMT experiences may have been even closer to NDEs (this said, scores could also be significantly higher and thus more *dissimilar* to NDEs, as suggested by the 'entering other worlds' item being notably higher in DMT vs. NDEs).

Psychedelics as mystico-mimetics and entheogenics

Especially relevant to the study of considering psychedelic DMT experiences as spiritual experiences, and spontaneous experiences such as NDEs as potentially mediated by endogenous psychoactives, Griffiths *et al* (2019) have conducted a large-scale survey of "God-encounter experiences" – that is involving one's understanding of God, an aspect or emissary of God, a Higher Power, or Ultimate Reality – comparing spontaneous (non-drug) experiences, and those occasioned by the classical serotonergic psychedelics. While it was not explicitly analysed if the former group indeed contained experiences from NDEs, such 'God encounters' are fundamentally featured within the NDE, where references to "God" are one of the utmost repeated words in the largest database of accounts (Long & Perry, 2016). Such experimental studies into psilocybin and DMT reveal a reliable occasioning of profound mystical states (Griffiths *et al*, 2008; Timmermann *et al*, 2018), and participants frequently spontaneously report entity encounters of a God-like quality (Davis *et al*, 2020). However, some theorists argue these drug-induced episodes to not be authentic religious experiences (Kellenberger, 1978), while others suggest that they do have legitimate religious import (Smith, 1964), and indeed, psychedelic plant/fungi usage with the express intent to connect with the preternatural realms likely dates back multiple thousands of years (Ott, 1996). Griffith *et al*'s survey in fact found 64% of the psychedelic group to have a complete mystical experience, versus only 43% of the non-drug group – where (though the

mystical experience questionnaire was validated against psychedelic experiences) the fact that almost half of theistically interpreted, naturally-occurring God encounters were also complete mystical experiences challenges Stace's criteria for such mystical states to be in no way referential to God.

69% of participants of the survey were male, and 88% were White, meaning a particular demographic bias. Mainly regarding drug and non-drug comparisons – DMT was the most likely subgroup to report a God-like encounter, which was also more likely to involve a sense of communication or information exchange, but both spontaneous (36%) and psychedelic groups (32%) similarly considered the encounter to be 'more real than real'. 70% of both groups considered the 'entity's' existence to be of an independent dimension (i.e. continue to exist), and similar proportions reported consciousness and intelligence, but the psychedelic group had greater potential for maliciousness, where spontaneous encounters were more likely benevolent, sacred, petitionable (i.e. responsive to prayer), and have agency (i.e. act within this reality). Intriguingly, a comparable proportion of 20% of both groups reported a prediction of the future (that is, a prophecy or precognition).

As regards comparisons mainly between the psychedelic subgroups – DMT and ayahuasca were significantly higher for that encountered being conscious, while ayahuasca was significantly higher for being conscious, intelligent, benevolent and petitionable (akin to natural encounters), versus psilocybin/LSD. Ayahuasca encounters had significantly more communication. DMT was predominantly the same as ayahuasca on most counts, except for less endorsement of entities existing independently, being petitionable, or positive change in social relationships. DMT, versus psilocybin/LSD, was more likely to involve an intention for an encounter, but also communication to be initiated by the 'entity' and being of a visual or 'extrasensory' nature, and what was encountered being conscious, intelligent, benevolent and existing in another realm. Mystical experience score, and time-space transcendence and ineffability domains, were significantly higher for DMT versus psilocybin and LSD.

The non-drug group were much more likely to elect "God" as the most appropriate descriptor, while the psychedelic group elected "Ultimate Reality", and granted Smith's (1964) counter-argument of the 'principal of causal indifference' – asserting if two experiences are phenomenologically indistinguishable (as suggested by this survey) it

cannot be concluded that one is genuine but the other is not – it may be such labels reflect differences in semantics and conceptual interpretation, particularly as used by different subcultures to which psychedelic users versus NDErs likely belong, versus ‘actual’ differences. Overall, DMT encounters versus psilocybin/LSD were significantly more likely to have been instigated by an intelligent and benevolent entity from another dimension communicating typically by telepathic means – components highly reminiscent of near-death experiences, though also importantly of abduction/alien encounter phenomena (Mack, 2000).

When comparing between drugs, while there were many discrepancies identified between DMT and psilocybin/LSD, this may have been an artefact of users infrequently taking very high doses of the latter, which would otherwise present as more comparable to ‘breakthrough’ DMT experiences. This would, in turn, lead psilocybin/LSD to better capture the near-death experience, and such typical non-‘heroic’ doses may be another reason for these substances lack of attention, versus DMT, in terms of NDE-conduciveness.

Peculiarly, religious affiliation was not reported – however, more than two thirds of those identifying as atheists no longer identified as such after their experience, and interestingly in the psychedelic group, identifying as a ‘monotheist’ significantly decreased and ‘other’ significantly increased. Fear of death was alleviated in 70% of the psychedelic group, particularly amongst DMT experiencers, and 57% in the spontaneous group, where such ontological and existential shifts are also mirroring of findings from NDEs (Groth-Marnat & Summers, 1998; Kenneth Ring, 1992). Ayahuasca was also significantly higher for life satisfaction, mood, social relationships and spirituality versus psilocybin/LSD. 34% non-drug and 43% psychedelic encounters were said to be participants’ *most* meaningful or spiritual experiences, with ayahuasca being significantly higher versus psilocybin/LSD. All such alterations are consistent with after-effects commonly induced after NDEs; enhancement of spiritual and diminishment in materialistic world-views, promoting of death acceptance and positive interpersonal life (e.g. Greyson, 2006).

Other candidate NDE-ogens

Perhaps the next most studied compound as per potential endogenous mechanisms of the NDE is the non-classical (NMDA-antagonist) dissociative psychedelic, ketamine (Grinspoon & Bakalar, 1979; Morse et al., 1989; Rogo, 1984). At the same time as Strassman's *The Spirit Molecule* (2001), Jansen's (2000) *Ketamine Dreams and Realities* also elaborated on his prior arguments (Jansen, 1989) for the near-death experience as being mediated via endogenous ketamine-like chemicals (referred to as 'endopsychosins', though proposed much earlier, by Grinspoon & Bakalar, 1979, and Rogo, 1984) being released to mitigate, via antagonism of the glutamate NMDA receptor, excitotoxic injury during hypoxia and its sequelae, i.e. epileptic discharges, upon physical trauma such as near-death. But also, that this NDE mechanism may activate spontaneously (that is, during such fear-death or 'NDE-like' experiences), given the NMDA receptor's crucial role in an array of psychophysiological functions such as sleeping and dreaming. A list of candidate neuroprotective NMDA-blockers have been suggested such as NAAG, kynurenic acid, magnesium (Jansen, 2004) as well as agmatine as the sought-after "NDE-ogen" (Thomas, 2004). Jansen's (2000) book compared the NDE and ketamine experience in the same individual, with both the participant and Jansen concluding them to be essentially the same.

Converging research shows that ketamine may evoke all classic experiences of ESP, communication with the dead (Case, 2003; Wyllie, 1981), as well as OBEs or autoscopy far more commonly versus non-anaesthetic, e.g. serotonergic psychedelics (Wilkins et al., 2011). Corazza (2008) later added some empirical precision (albeit not in a randomised controlled trial, as with Timmermann *et al's*, 2018 DMT study) by comparing results on the NDE scale between 36 ketamine ('K') reports (though, only from a sub-sample of users reporting a K trip which was explicitly NDE-like out of up to 2,000 trips) and 36 NDE reports of those suffering events like cardiac arrest. Substantial overlap was identified in terms of frequency of OBEs, peace, time-distortion (all common in NDEs, Charland-Verville et al, 2014) life review and extra-sensory perception (uncommon in NDEs) – though *K-NDEs* were much less likely to experience a border of no return, deceased or religious beings and light (common in NDEs), and far more likely to experience universal unity (Luke, 2009). Notably, quality was measured over quantity, as only K trips considered NDE-like were compared with true NDEs, and were cherry picked from 1000's of ketamine experiences (Luke, 2009).

Despite this though, Dakwar et al. (2019) administering ketamine (also alongside mindfulness meditation) in a randomised controlled trial for cocaine abuse, did find experiences qualifying as NDEs which scored a mean of 11 on the NDE scale (threshold=7).

Martial et al. (2019) conducted a comprehensive natural-language processing of approximately 15,000 psychoactive drug reports, spanning 165 substances, and 625 NDE narratives, finding that ketamine experiences were indeed the most phenomenologically comparable to the NDE versus all other psychoactives, then followed by *Salvia divinorum*, another atypical (Kappa opioid agonist) dissociative psychedelic, itself closely followed by 7 serotonergic and other monoaminergic psychedelics: Peyote, LSD, 5MeO-DMT, psilocybin – *NN*-DMT – and Iboga and Ibogaine (the latter also conferring NDMA-antagonistic effects) – and ayahuasca as the 10th most similar. Indicative of these results, thus far under-investigated is the potential role in NDEs for the kappa opioid system or 5HT-2A activating psychedelics apart from DMT. At least as regards the latter molecular class, this may be owing to an emphasis on chemicals with endogenous analogues – yet the canonical neurotransmitter serotonin (if with sufficient 5HT-2A receptor stimulation, as discussed below) may well itself be psychedelic and confer the near-death experience. Additionally, such semantic overlap exhibited by these serotonergic/monoaminergic drugs is remarkably akin to the neurochemical cocktail deluged upon rodent death (Li et al., 2015; again below discussed).

Neurothanatology: The study of the dying brain

The research surveyed thus far strongly suggests that classical psychedelics can *simulate* the phenomenology of the experience near-death, which is compelling but indirect support for their role as physiological triggers. But there are ground-breaking discoveries within the burgeoning neurobiology of death and dying illuminating highly complex neural activity transpiring during this process, some of which indicating that these substances or their endogenous analogues can not only simulate, but actually physiologically contribute to the experience.

Hypoxia (oxygen deprivation) and attendant hypercarbia (excessive CO₂) are the obvious first candidates for NDE aetiology. Despite some inconsistent results (Sabom, 1982; Parnia

et al, 2001), perhaps most robustly Klemenc-Ketis et al. (2010) did evidence hypercarbia in cardiac arrests with NDEs versus those without. The anoxic disinhibition and hyperexcitability of the neuron-dense fovea, i.e. centre of the optic tract versus peripheries, has been conjectured to account for the phenomenon of the growing light and tunnel vision (Blackmore, 1993). Recently, Blanke et al. (2015) have compellingly supported this in their discussion of the subtle but distinct ischaemic injuries observed within the optic tract after cardiac arrest.

As per the out of body experience, again Blanke et al. (2015), substantiating past work (S. J. Blackmore, 1996b), report lesions within the temporal-parietal junction (TPJ) in OBE experiencers with epilepsy and TLE, and stimulation of the TPJ eliciting OBE phenomena – concluding such extra-corporeal projection of body-schema and self to be resultant from critical disintegration of multi-sensorial central processing. That the “temporal lobe is almost certain to be involved in the NDE” (French, 2005, p. 357) is a consensus of most researchers, though only one investigation specifically into this lobe of NDErs identified epileptiform spiking in the left temporal lobe (Britton & Bootzin, 2004) – albeit only compared to general controls, where the activity may have been associated with the brain trauma versus the NDE *per se*.

Pertaining to sleep, dreams or arousal and its neurology, NDErs have been shown to report more symptoms associated with REM intrusion and in turn brainstem sleep-wake abnormalities, such as hypnogogic hallucination and sleep paralysis (Nelson et al., 2006), and NDEs are more common in those reporting REM intrusions (D. Kondziella et al., 2019). The resonance between NDEs and lucid dreams, which characteristically occur in the REM phase, is indirectly supported by the finding of serotonergic psychedelic reports being amongst the most semantically equivalent not just to NDEs (as above) but to lucid dreams (Sanz et al, 2018). That NDEs from patients with locked-in-syndrome, that is infratentorial brainstem lesions, included less experience of peace or wellbeing over NDEs after coma with supratentorial brainstem lesions, might also suggest the experience’s positive valence to stem from pontine/paralimbic function (Charland-Verville et al, 2015). Such focal brain injuries (as with the TPJ-OBEs), especially by stroke, clearly offer fertile foundations for further research into the differential contributions of niche brain regions in the disparate phenomenology of the NDE.

Very few studies have investigated the neural correlates of the NDE in experiencers themselves. For instance, Palmieri et al. (2014) illustrated that NDE memories were equally as phenomenologically rich as real memories, and the NDE state under hypnotic regression was associated with activity in the two slow-wave frequency bands; theta and delta, the former indexing episodic memory, and both marking general recall and various trance-like or hallucinatory states. This is in keeping with the identification of DMT eliciting greater power in the theta band, specifically over the temporal cortex (Timmermann, 2019). Beauregard et al. (2009) have also observed elevated theta power during meditative connection to the 'being of light' encountered in subjects' previously experienced NDEs versus control condition, mainly over the frontal lobe. In this way then, such slow-oscillatory, especially temporal lobe, activity may be shared core neural correlates not only of the TLE, psychedelic or dream state (Carhart-Harris, 2007), but also of the near-death experience.

Endogenous psychedelics as contributors to the NDE

One original important attempt at an interactive 'multi-factorial' model, integrating the release of neurotransmitters, implicated early hypoxia, and subsequent medial temporal lobe (mTL) discharge and endorphin release (Saavedra-Aguilar & Gómez-Jeria, 1989). However, a concurrent report by Morse et al. (1989) hypothesised similarly, though one which – perhaps more presciently in terms of recent development – emphasised hypercapnia, and crucially serotonin release, which stimulates such temporal lobe structures (and in positive feedback fashion may release further serotonin). This is echoed by a more wholistic tripartite model proffered by (Martial et al., 2020) integrating hypoxia-hypercapnia, disinhibition of mTL, TPJ and anterior insular, though here stressing ketamine-like endo-NMDA-antagonist and endorphin secretion. This is, in turn, mirrored by the paralleling of TLE seizure and psychedelic drugs (and dreams) as evoking unique slow-wave temporal cortex activity responsible for the emergence of unconscious material (Carhart-Harris, 2007).

A burgeoning field in recent years is that of the cognitive neurobiology of the death process. For instance, Dean *et al* (2019) found that, at least in the rodent model, not only is endogenous DMT is present in the cortex, but at levels comparable to the canonical

neurotransmitter serotonin. Most saliently, upon cardiac arrest there was a maximum increase in DMT of 6.18 times that of baseline values in the occipital lobe, with 60% of rats demonstrating more than two-fold increases, and 32% showed up to 1.5-fold change. However, earlier from the same lab, Li *et al* (2015) have demonstrated the release of a veritable deluge of different neurotransmitters in rats for as long as 20 minutes after asphyxia. In respect to monoamine transmitters alone, in the first minute noradrenaline was elevated in the frontal lobe 30x that of baseline values, dopamine rose globally more than 12-fold – but perhaps most saliently for this discussion, serotonin surged to 20-fold in the occipital lobe and 70-fold in the frontal cortex in the first 2 minutes, and then to an enormous 250-fold at 4 minutes. Such vital data may thus provide a form of ‘indirect neurophenomenology’, tying neural activity to known NDE features. For instance, features such as euphoria, elevated lucidity and well-consolidated memory are variously shared neural functions of the catecholamine transmitters – and serotonin, in particular, upregulated to an astonishing ~250-fold 4-6 minutes post-asphyxia, is perhaps responsible for occasioning the more transcendent and other-worldly dimensions.

Crucially, Nichols & Nichols (2020) highlight that such serotonin flooding alone is a far more likely candidate for near-death experiences than DMT’s comparably fractional and localized production (at least, as evidenced so far). They explicate too that serotonin in fact possesses a 10-fold higher affinity for the 5-HT-2A receptor (conferring psychedelic effects) than DMT, and this is even further compounded by serotonin’s cortical concentrations being at least double that of DMT. The receptors would therefore be saturated with serotonin, perhaps entirely preventing DMT’s binding. Critically, high serotonin concentrations are known to induce the mouse head-twitch response, also dubbed the “psychedelic signature move” (Buchborn, 2019; Schmid & Bohn, 2010), which is the animal proxy for hallucinogenic activity (i.e. serotonin itself may be psychedelic). In spite of these issues, Dean (*personal communication*, 17th December 2019) draws attention to the fact that Li *et al.*’s paper showed changes across the brain at minute-by-minute intervals, while their study was only within the occipital lobe at 15-minute intervals – i.e. DMT may yet be at higher concentrations and throughout other cortices.

In respect to the EEG activity also evidenced by Li *et al* (2015), this chemical deluge can be considered the neurotransmission substrate for a neuroelectric wave, found to

concurrently wash over the cortex, indexing of sophisticated consciousness processing – that is, high frequency, coherent gamma activity within the 30 seconds between cardiac arrest and isoelectric EEG – with very similar results also observed elsewhere (Borjigin et al., 2013; Lee et al., 2017). Decapitation of awake rats has additionally been evidenced to evince high-power *slow-wave* neural oscillations after 50 seconds (van Rijn et al., 2011) – further mirroring the aforementioned delta/theta predominance exhibited by NDErs and the DMT subjects. Translation from rats to humans (rodents to Rodin), while both mammalian, is a contentious issue. However, Auyong et al. (2010) and Chawla et al. (2009) have reported on humans exhibiting a high-frequency (gamma-like) burst in frontal recordings after life-support withdrawal and prior to flatlining, coincident with blood-pressure loss in the former report and after a brief delay in the latter.

Collectively then, such data on terminal neurophysiology are compellingly indicative of an ultra-functional brain ushering its swansong upon the brink of ultimate quiescence, which may well carry with it exceptionally complex, vivid and intense subjective experience aligned with the quality of the NDE – in lieu of the assumed dysfunctional brain offering only paradox to the emergence of such mystical-type preservation of consciousness at death.

Finally, any naturalistic explication of the NDE does not readily accommodate fear-death or NDE-*like* experiences elicited without these neurological insults or the cascades they set in motion. However, here, psychological mechanisms may be instrumental. For instance, the psychological trait of fantasy proneness has been shown to be significantly higher in those reporting other NDE-like experiences (e.g. meditation, syncope) compared to classical NDEs and non-experiencers (Martial et al, 2018). This would likely render such persons, in synergy with other psychological traits such as absorption (Timmermann et al, 2018) and/or dissociation (Ring, 1992), more susceptible to ‘constructing’ and immersing oneself in the NDE, characteristic as it is of a disconnected conscious state (Martial et al, 2020), even in the absence of genuine death-threat.

Ultimately, a triangulation of research can be achieved to assess DMT’s relationship with the NDE when combining the previous findings from the psychometric, neurobiological, and the present work’s novel phenomenological studies.

Answers in the anomalous: 'Psi' at the final sigh

Evidently, a more nuanced and integrated picture of the origins of the near-death experience is beginning to resolve. Yet in spite of these strides, the riddle of consciousness itself, let alone mystical transmutations thereof, is yet to be solved, and there is a plethora of NDE phenomena not readily subsumable under the neuro-reductionistic umbrella. Certain elements, such as veridical perception and other anomalous experiences, may yield only to explanation in terms of non-local models of consciousness, including those invoking quantum-like processes or higher-order space-time (Lake, 2017) – which may, or still may *not*, imply survival. Such quantum models are discussed further in the discussion to the thesis.

Pam Reynolds has been an oft-cited case of a veridical NDE-OBE (Sabom, 1998), undergoing 'hypothermic cardiac arrest' entailing an hour of halted circulation. Though critiqued for failed anaesthesia and the correctly reported events in her surroundings seeming to occur before and after, not during, her cardiopulmonary bypass – accurately constructing an internal model of her environment, despite brain-metabolism disabling drugs and taped eyes and plugged ears, still seems an unreasonable explanation. Woollacott & Peyton (2021) more recently report on the latter author's deep NDE upon cardiac arrest during high-risk C-section, which did appear to incorporate detailed verified perception aligning with the arrest time-window. And similarly, Khanna et al., (2018) discuss the case of Eben Alexander's profound NDE during meningoencephalitis, arguably involving more acute cortical damage versus cardiac arrest, who also rightly reported non-family members at his bedside during deep coma and severe brain injury (Glasgow coma score 6).

A plethora of other such cases have been chronicled (Rivas et al., 2016), but three particularly compelling verified NDE-OBEs are published within prospective studies in hospital settings (van Lommel et al, 2001; Parnia et al., 2014; Sartori et al., 2006). This being so, a survivalist disincorporation of consciousness may not be demonstrated *per se* by these striking case studies. For instance, Parnia et al. (2014) compute their subject's OBE to have 'transpired' 3 minutes into cardiac arrest which they consider well-passed the threshold for neural integrity – though, this is a comparable duration to the above discussed gamma bursting in humans at loss of vital signs, and as such, such terminal surges still align with, and may explain, the OBE. Of course, its veridicality, which the authors claim, is less able to

be explained. Relatedly, if not evidence for survival, these case studies may still be persuasive evidence for *psi*. Specifically, 'perspectival ESP', a kind of disembodied precognitive vision, could also always be argued to have been stimulated upon the brain's shut-down (or reanimation). This is especially given the above discussed flooding at this time of endo-psychedelics i.e. agents like DMT, which are themselves suggested to be psi-conducive (Luke & Kittenis, 2005; Luke, 2019).

Similarly, also indicative of parapsychological mechanisms – be they suggestive of posthumous perseveration or 'just' a non-locality to consciousness – encompass a range of other phenomena. These include 'shared' or 'empathic death experiences', that is, present loved ones' partial fellow-journeying into the dying's death experience (Moody and Perry, 2011), which are striking due to the onlookers' sound brains – yet they are akin to crisis apparitions or telepathy. 'Mindsight' describes the testimony of blind individuals' NDEs, where 64% of those congenitally blind claimed to experience visual components, which may be a form of transcendental perception (Ring & Cooper, 2008) – yet may also be consistent with clairvoyance. 'Peak in Darien' experiences near-death are unwitting encounters with loved ones who had died simultaneously or immediately beforehand (Greyson, 2010) – yet may be explained by 'super psi', that is knowledge of their deaths obtained via telepathic/precognitive means. This said, the superpsi argument may sometimes be undermined if the NDE experiencer, or those linked to the experiencer or the witnessed deceased, are not informed at the time nor in the future of the deceased's demise in cases where the experiencer does eventually die (i.e. there isn't the available information to divine via psi, and discarnate contact is more plausible). Nuanced alternatives are that the NDEr may have the information of the other's death communicated to them via psi means as the other dies, or that psi is actually the means by which information is transmitted from existent discarnates e.g. telepathically. Superpsi, additionally, is critiqued by the tortuous levels of criteria or events which are required to explain the information access (e.g. about another's death in Peak in Darien instances), where genuine encounters with the dead may be more parsimonious (Braude, 2003).

If not offering an affirmative answer to the question of 'is there life after death?', in the final analysis, such anomalous and enticing phenomena as these, entreat every person to appreciate the rationale behind many investigators' call for a reformation of the prevailing

paradigms. This is so that we might arrive at an understanding of, and make peace with, that which is the only *sine qua non* for the gift of life – death.

Chapter II: Methodology and Methods

Methodology

Epistemological approach: Critical Realism and Psychedelic Realism

The thesis takes a 'middle-way' approach to qualitative epistemology, between the realist-essentialist and constructionist approaches, by way of taking critical realism as its primary epistemological frame (and 'psychedelic realism' as secondary, discussed below). Critical realism constitutes an epistemological framework which accepts that there are objective realities with intrinsic properties independent of observation, but that when such realities are inevitably observed, they are viewed via subjective perception; that is, there is one reality but a plurality of interpretation. Knowledge about the world is thus always relative to the observer, and so culturally and socially situated – however, such differing accounts will be better or worse, remoter or more accurate images of this world, constrained by what is inherent and real (Archer et al., 2016). While the world may not be reduced to observable objects and facts, to alternatively conceptualise it only in terms of constructionism is misleading. Social constructions are thus framed in an objective way, meaning that while the phenomenon may be socially moulded this does not make it any less real (Alvesson & Skoldberg, 2017).

It is important when considering the epistemological position of this thesis to be cognizant that the experiences explored at this work's centre are not typical of most objects of qualitative study (mostly 'everyday' human experiences arising from interpersonal/social consequences). They are acute experiences, not found in normal waking consciousness, which are occasioned by biological processes. The critical realist's more inclusive approach is attuned to the nature of these experiences (psychedelic and near-death), given that they may reside in an especially pivotal nexus point between both the objectively real (essentialist) and wholly culturally defined (constructivist). Specifically, it is emphasised in this thesis that both such experiences have discernible correlates within the objective system of the brain, and are profound conscious experiences which are declared as more real than real by participants with distinct impacts on their lives, attitudes and behaviours.

With this latter, one is reminded of William James' emphasis on the *noetic* quality to mystical experience (touching the ground of being), and his proclaiming "by their fruits he shall know them" – where critical realists may also operationalise 'the real' as something exerting causal effect on the world (Alvesson & Skoldberg, 2017). This said, these experiences are also evidentially at least a partial product of personal and cultural hermeneutic frames.

In this way, as may be more finely developed in the unfolding of this thesis, a split between the gross 'structures' and the more detailed 'content' of the experiences elicited by psychedelics and NDEs may be a simple heuristic to understand their relationship. The phenomenological structures, consistent across time and culture, may thus arise due to neurological structures – or indeed derive from some transcendent source – while the content, widely differential across reports, may well hail more from the historical and cultural memories of the experient. As such, the structure may sit more in the realm of realism, while the content may reside in that of social constructionism. In similar vein, taking the (perhaps false) dichotomy between realism and constructionism, and their emphasis on the individual and collective, respectively – psychedelics are known to be especially sensitive to the issues of 'set and setting', that is the specific content of each given experience as driven from material within the subject him/herself and their immediate and cultural context. Given that both this more objectivist and interpretivist lens is embraced and explored by this thesis (though the neural bases may be given particular voice in the final discussion and that of each chapter), the critical realist framework is certainly an ideal one.

Critical realism in its 'stratified' ontology also delineates between the *empirical*, i.e. what is perceived by the human subject to be the case, the *actual*, i.e. what is in fact the case independent of subjective apprehension of it, and the *real*, i.e. the 'deep' mechanisms themselves explaining the phenomena, conditions hidden to the experients and observers (Vincent & O'Mahoney, 2018). This model again may be considered to resonate with the subject matter of this thesis and how it is dealt with. The psychedelic and near-death experiences are vulnerable, perhaps especially so (due to such neuropsychological factors of elevating suggestibility and proneness to false-memory), to exhibiting a gap between the phenomenon's cultural filtration and articulation (the empirical) and the phenomenon in itself (the actual). But also, the mechanisms by which they emerge are also explored by the

present thesis to be at least in part arising due to 'hidden' *neural* structures (the real). The former would be essentially consistent with Kant's *Phenomena*, while the latter two could be considered consistent with Kant's *Noumena*. While not explored in depth by the present work though certainly discussed, critical realism's presentation of such deeper mechanisms may also allude to a metaphysical quality (in their 'unobservability'), where these psychedelic and NDEs may well derive from metaphysical sources.

Importantly, the unique effects that psychedelics and near-death experiences have on the brain may have a very interesting bearing on the epistemological options by which this thesis is framed. Segall (2020) transmuted Whitehead's philosophy of 'organic realism' into that of *psychedelic realism*. He notes that while Cartesian philosophers may situate the mind as a disembodied transcendental onlooker onto a dead natural world from which they feel alienated and do not belong – Whitehead reorients us to realise the immanence of the world in which we are enmeshed, that "We are not enjoying a limited doll's house", but "In the darkness beyond there ever looms...the universe begetting us" (Whitehead, 1947). Segall stresses that Descartes' duality and the estrangement it engendered left deep impressions in the modern mind, to the extent that when the noetic dissolution of the mind-body model emerges in the throes of psychedelic (or indeed, near-death) experiences – it may be discarded as mere hallucinatory revelry. However, perhaps it is this Cartesian theory, ingrained as a perceptual heuristic as it is now, which is the paranoid hallucination – and ergo, the psychedelic (or NDE) state may offer a 'psychedelic (or NDE) realism' by casting off this obscuring assumption.

The present work attempts to link this concept of psychedelic realism to the ever-growing traction received by a model of the brain-functioning of psychedelic agents – that of psychedelics entailing the disruption of hierarchical predictive-coding mechanisms of the cortex and the elevation of neural entropy (anarchic activity). The cortex in this view does not in fact allow (as perhaps intuitive) the direct apperception and processing of raw incoming sense data, but instead has learnt the features of the external world and thereby built them into its internal model. Only fractional sensory information gains entry to higher level cortical areas (consciousness) when there is a mis-match between novel sensory information and the pre-extant internal simulation of it. Under the influence of psychedelics however, these higher-order 'priors' generating the model are degraded in their 'precision'

of correctly predicting the sense data, and therefore leading to disinhibition of lower brain-centres and the entropic induction of unmediated sensory information now permitted into the cortex and thus consciousness. This is the Relaxed-Beliefs Under Psychedelics (REBUS) hypothesis (Carhart-Harris & Friston, 2019), which ultimately accounts for many phenomenological elements to the experience, not least the mystical experience encompassing (not only ego-dissolution or the unitive state, but) its noetic quality – that is to paraphrase Blake, “the world appears to man as it is”. In light of this, perhaps the *psychedelic realism* espoused by Segall (2020) may be the better epistemology to adopt here. It brings to light – in a similar way to critical realism, though with this importantly finessed neuro-psychedelic dimension – that realism and constructionism *per se* are each too limited in their purview of the phenomenal world as purely objective or constructed, and that they do not align with the model of the world suggested by REBUS which instead represents an inextricably linked tension at the nexus of the mind-brain complex between the imagined and the immanently real, and which the experiences analysed herein may answer to.

This being said about the REBUS model, implying psychedelics’ involving a disidentification with a world simulation and reconnection with the world as it is, is not without its caveats. For instance, the psychedelic experience is a complex phenomenological spectrum, where only some dimensions may be characterised by raw, unmediated sensory experience, while others by evidently hallucinatory events, where the cortical internal world-model is one which has been carefully constructed over evolutionary and developmental time to accurately represent the environment for survival-maximising purposes. As such, its breakdown via psychedelics may alternatively distort, at least one’s perception of, reality. Additionally, the DMT experience and near-death experience, in contrast to other typical psychedelic experiences, are rather more accurately characterised by dissociation and immersion into an apparently novel sensory environment. This construction of a world ostensibly independent of that of the consensus world is observable at the point of ‘breaking through’ in the DMT experience, which may be linked to a distinct switch to the predominance of theta brainwave activity (Timmermann et al., 2019). While the adoption of ‘psychedelic realism’ may not be couched as much in terms of the external world’s being served to consciousness directly via one’s sensory nervous system, the ‘reality’ to which it

refers would depend on the ontological status of the newly inhabited world in the DMT or NDE state – be it neurally and culturally built, or indeed metaphysically accessed (A. R. Gallimore, 2019).

Finally, although the thesis is predominantly qualitative in methodology, it also includes one quantitative psychometric measure, the NDE Scale, across all studies, as well as a major discussion point on the linkages between the phenomenological data and current neurological understanding. This mixed-methods focus also gestures to critical realism being the better theoretical frame. This is owing to the framework overcoming the ‘odd dualism’ typically pitted between quantitative (typically positivist, deductive, theory-driven) and qualitative (typically constructionist, inductive, theory-driving) methods (Vincent & O’Mahoney, 2018).

Reflexivity in Qualitative Research

Crucial to take into consideration is that the use of qualitative research in psychology – which makes up the vast majority of the present thesis – does not, and cannot adhere to precisely the same methodologies as the so-called ‘hard’ sciences, which themselves inherently have less scope for subjective influence and are thus more founded in objectivity. The topic of study for qualitative research is fundamentally a subjective one, where even within psychology itself, though both experimental and qualitative psychology involve the recruitment of human participants (or ‘subjects’), the former will employ quantifiable measurements while the latter will use analyses such as thematic or content or interpretative phenomenological analyses, which are vulnerable to the influence of the researcher’s interests, biases or agendas, either consciously or unconsciously.

Qualitative research by definition entails complex interaction with participants (Mruck & Breuer, 2003), wherein the investigators not only actively contribute to the construction of the outcomes, versus being the passive agents of extraction, but are themselves shaped by the rich engagement with other human actors during the revelation of intimate lived experience and meaning-making (Palaganas et al., 2017). The researchers are in this way never neatly situatable as ‘outside’ the sphere of the inquiry and resultant generation of understanding via the research processes (Dowling, 2006), and the researcher-participant

boundaries are inevitably more permeable, which not only has implications for objectivity but, importantly, ethical considerations (Reid et al., 2018).

It is a minimum requirement, then, for any given qualitative research to reflexively admit these dimensions intrinsic to it (Braun & Clarke, 2006), but additionally to stipulate examples specific to the researcher's own report, for instance of how the researchers themselves may have influenced the interpretation of the data, for the purposes of enhancing integrity via transparency (Elliott et al., 1999), as well as any attempts made to minimise the possible undermining influences on objectivity or rigour in light of such researcher impact on analysis (Larkin et al., 2011).

At least one example of such possible influences of the qualitative method in this thesis includes, for the studies of chapters 3-5, the stage of interviewing, wherein I myself conducted only a proportion (though approximately equal), and the remaining by the first supervisor (DL). As such, this may not only have led to differences in social interaction with the participants including rapport building, but while my questions were closely adhering to the semi-structured interview (SSI; as provided in the respective chapters' appendices) and the interview was as long as possible for thoroughness, the remaining interviews may have been less so and shorter meaning varying quality and volume of data.

As regards precautions taken to maximise the rigour of the qualitative approach, while not per se addressing the biases linked to the researcher (though similar precautions were taken in the construction of interview questions), biases and reflective preconceptions on the part of the participant during the interviewees' responses were highly controlled by the SSI procedure being directly inspired by the microphenomenological technique. This technique, amongst other attributes, seeks purely pre-reflexive responses by encouraging the participant to cease all recourse to socially propagated categories to constrain their experience, but instead return to raw descriptions detailed in their own words (Petitmengin, 2006; 2017).

Additionally to this, in direct addressing of my manipulation of the data and conclusions made being sensitive to prior experience or prejudices, by the time of completion of all analyses of all studies, I had not partaken in any consumption of the three main psychoactive substances examined in this thesis – *N,N*-DMT, changa and 5-MeO-DMT. This

was with the express intention of maximising a position of researcher neutrality, creating a responsible distance between researching agent and the researched experience to avert certain biases, which may well be unconscious and thus insidious in nature. Direct apprehension of these psychedelic experiences, on account of the present studies' analyses, I do believe enhance the researcher's comprehension of these states to exceptionally nuanced degrees (as is demonstrable by so-called 'psychonauts' fine-grained understanding of these exotic states) and thus illuminate the analytical process to come to a potentially far more accurate depiction of these experiences of interest. However, in light of this particular thesis having a further aim not limited to the qualitative analyses, but related to an eventual enmeshing of the findings into broader frameworks including the neurobiological but also the parapsychological which have implications for ontology, it was considered that the lack of the three experiences in question by the researcher would help maintain a more critical posture. This is on account of evidence that even a single psychedelic experience can lead to a broad spectrum of fundamental alterations in one's metaphysical belief structures (Nayak et al., 2022; Nayak & Griffiths, 2022; Timmermann et al., 2021).

Acknowledging the gross crudeness in speaking of such a profound matter in such sterile terms – during the course of this PhD, I experienced the death of a loved one. In light of this, one of the core subject matters of this thesis, death and the near-death experience, was no longer the exclusively academic subject of interest but immediately became an unavoidably personal experience, which I was forced to confront in an extremely intimate and visceral way. This being said, this event transpired after all formal analyses were completed and only before the final writing up phases of the thesis, and thus any impact of this on the data interpretations and immediate conclusions are non-existent – though it could be feasible that content of the discussions, including those of the final thesis discussion, may not be as preserved in this way.

Finally, in providing a very brief overview of my lived experience of the process of completing this thesis, there were a number of academic challenges that I was forced to face – alongside the also numerable, fortuitous developments. Most of these, I believe, were located at the very outset of the PhD and set a certain oppressive tone for much of what was to follow. There were a series of unpursued projects included in the original proposal – endogenous DMT measures and EEG explorations (detailed in Chapter 8, under

Future research) – which would have added quantitative rigour and significantly broadened what eventually became an exceptionally narrow thesis looking exclusively at the qualitative nature of DMT and NDEs. Similarly, there were further studies which were provisionally agreed to be included as collaborative projects with Imperial university, London, and which were significant motivators in my decision to undertake the PhD as a whole. One was qualitative analyses of Imperial’s DMT continuous infusion, apparently not eventually included because Imperial’s PI (CT) had not in fact accepted the collaboration (despite my impression from supervisor), and another of secondary EEG analyses of their participants, not included owing to their being too similar to analyses already run by CT (itself likely due to poor communication on my part).

Lastly, it remains a sincere and poignant question, despite the deft fashioning of Chapter I (especially *Justifying the present work*) and the *Rationale for the study* of Chapter V, if the fundamental research aim of this thesis – comparing the qualitative nature of DMT (and analogous experiences) with the NDE to inform the former’s role in the latter – is a significant contribution to knowledge – and indeed worth claiming four years of my life. Liester (2013) and Potts (2012) had already approached this very question, in considerably smaller-scale reports, and arrived at not radically different conclusions to the present, arduous, and arguably superfluous, thesis. In similar vein, Timmermann et al. (2018), between acceptance of this thesis’ proposal and its commencement, showed that the DMT experience models the NDE in their structural components being virtually identical, meaning that the underlying neural correlates are likely also very similar. And similarly, Dean et al. (2019), several months after my commencing the project, unmistakably found endogenous DMT to be released in the mammalian brain at death. This is why such focus was made on reviews of the neuroscience throughout (especially Chapter 9) to maximise the rigour of the thesis. As such, given that they had arguably more compellingly answered it already, these projects had the potential to engender a real consideration on my part, and early on, in terms of radically re-framing or entirely replacing my objective – but it also remains a real question as to whether the expert at the time (my supervisor) should have been responsible for approving an approach of genuine use to the field, and which conferred a sense of purpose to me which was otherwise (sometimes egregiously) damagingly lacking. Due to this, the segment *From mechanism to meaning* was latterly inputted into the *Justifying the*

present work section, whose function was precisely to resurrect (to be idiomatically apropos) my PhD.

Despite all of this – and likely acting as highly influential reasons as to my perseverance with the research – there were numerous successes in the course of my studies. For instance, I have published seven peer-reviewed papers (see *Publications from the present thesis*), three of which in one of the highest ranking psychology journals, and directly contributed to this thesis (based on Chapter III, IV and VI) – with one (Chapter III) garnering more views than the journal’s top 99% most read articles (Michael et al., 2021), and another (Chapter VI) than their top 75% most read articles just over one month after publication (Michael et al, 2023). I have been invited to deliver or participate in dozens of lectures, panels, symposia and interviews, perhaps chief amongst which a lecture for the Psychedelic Society UK, August 2022, and a panel at Broughton Hall, as part of the private Tyringham initiative and dedicated to understanding the ‘sentient other’, October 2022. I was also awarded the Schmeidler Outstanding Student Award, 2020, from the Parapsychology Association. In this way, despite the above academic difficulties converging on emotional adversities, all of such successes have meant my establishing myself as part of the psychedelic research community and lead to both positive developments in my career and my interior life, which will hopefully serve as fruitful foundations for my fulfilling my life aspirations. That is – providing an eloquent perspective on the human experience via a leveraging of the natural sciences with a flourish of the sacred, and the discovery of meaning – a meaning which may be one of transcendence, or may be wholly immanent.

Methods

The methods for each study of the present thesis are described in full in the following. Given the methods for chapters 3-5 were mostly identical, deriving from the DMT Field Study, these will be presented as a single methods section. This is excluding slight variations on the methods for each, and as such additional sections on *analysis* regarding chapter 4, and *participants* and *analysis* for chapter 5, are presented separately afterward.

Chapter III: Thematic Analysis of the DMT Experience: An Encounter with i) the Other

Participants and Recruitment

Most volunteers were convenience sampled via online (social media) advertisement, with many sampled via snowballing. All prospective participants were subject to stringent inclusion-exclusion criteria. All recruited participants were experienced DMT users, with inclusion criteria entailing having taken DMT on 3 occasions, or at least significant other DMT analogous experiences such as ayahuasca or 4-AcO-DMT, with at least one 'breakthrough' experience (typically highly intense and perceptually immersive or remodelling; See Table 1). Participants were also required to provide their own DMT supply, exclusively of the form *N-N-dimethyltryptamine* (*N-N*-DMT; hereafter, referred to as DMT), and to live within the Greater London, Sussex or Kent area of the UK. Participants were selected in accordance with Johnson et al.'s (Johnson et al., 2008) volunteer safety guidelines for hallucinogen research, with exclusion criteria entailing prior psychedelic experiences which were difficult, i.e. putting self or others at risk, or leaving lasting psychological harm to self. The Structured Clinical Interview for DSM-IV Axis-I Disorders – Clinical Trials version (SCID-CT; First et al., 2007) was utilised by a trained SCID administrator as a screening tool, also excluding those with a current or past history of meeting DSM-IV criteria for schizophrenia or other psychotic disorders, or bipolar I or II disorder, as well as individuals with a first-degree relative with these disorders. Also excluded were those with lifetime presence of any major depressive or manic episode, substance abuse or dependence within the last 5 years, and any other current psychiatric diagnosis. Sixty-four prospective participants were screened, where 39 were finally included, resulting in 47 DMT sessions in the parent field study. Thirty-six sessions were the basis of the present thematic analysis, after removal of interviews not meeting several criteria, such as minimum use of 40mg DMT (see Figure 1 for details).

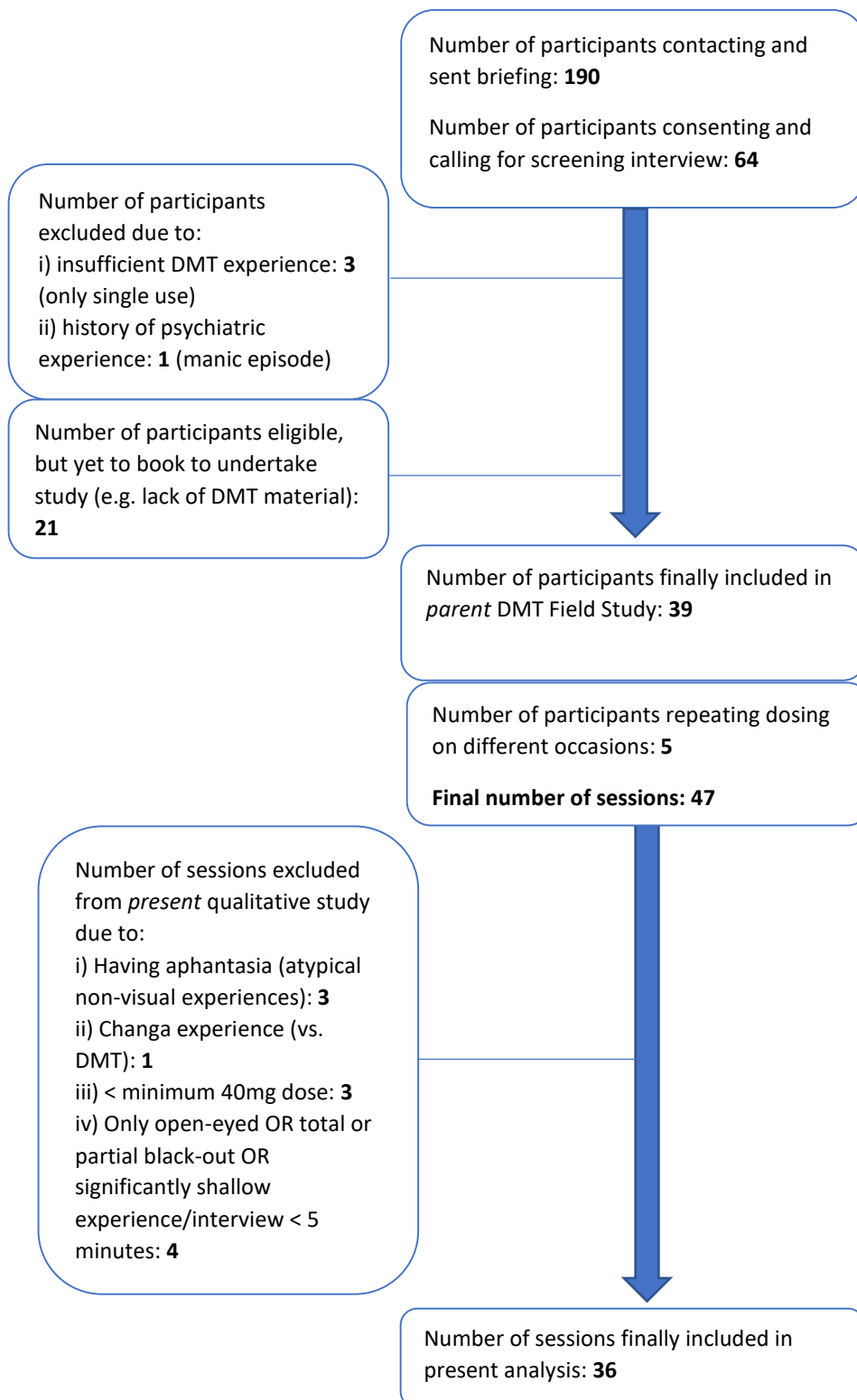


Figure 1. Participant recruitment flowchart – Inclusion and exclusion, and sample size overall and in final analyses

Table 1. Participant demographics and DMT experience

Average age, 37.4 (Range: 23-58), 8 Female, 83% Caucasian,; AYA = Ayahuasca; N/A = Unprovided (free to withhold information due to illicit activity admission)

<i>Prtcpt number</i>	<i>Pseudonym</i>	<i>Age (range)</i>	<i>Sex</i>	<i>Nationality</i>	<i>First time DMT used</i>	<i>Last time DMT used</i>	<i>Overall times DMT used</i>	<i>% break-through DMT experiences</i>
1	MP	45-49	M	White British	2011	11/2016	20	33%
2	TM (3 Doses)	30-34	M	White Romanian	2015	11/2016	5-6	100%
3	BB	35-39	M	White British	2013	02/2018	15-20	25%
5	JM	35-39	M	White British (Scottish)	2015	03/2017	12	66%
6	RV	40-44	M	White British	2015	08/2018	1 (+4 AYA)	75%
7	TC	25-29	M	White German	2014	06/2018	10-15	100%
8	HV	35-39	F	Black British (Ghanaian- Egyptian descent)	2016	02/2018	80	<100%
10	GR	25-29	M	White Romanian	2015	2015	2 (+ 4- ACO-DMT)	Once
11	SP (2 Doses)	35-39	M	White British	2003	06/2017	10-15	>50%
12	RH (3 Doses)	55-59	M	Asian British (Indian descent)	2013	08/2018	Hundreds	75%
14	AZ	25-29	M	Israeli	2013	02/2018	7	>40%

15	ZD	30-34	F	White British	2017	03/2018	20	90%
16	RS	25-29	M	Black British (African descent)	2016	05/2018	40	50%
17	LR	25-29	M	Chinese- Italian (Dual)	2010	2011	25	40%
23	AF	40-44	F	White Italian	2018	05/2019	2 (+ 8 AYA, 10 changa)	>75%
24	LG	30-34	M	Mixed British (Sri Lankan- German descent)	2011	07/2019	20	20%
25	AN	25-29	F	White British	2018	07/2019	7	>40%
26	EM	20-24	F	White Romanian	2017	05/2019	10	90%
27	AB	35-39	M	White British	N/A	N/A	10	100%
30	SH	30-34	F	White British	2007	2008	6	50%
32	OR (2 Doses)	25-29	M	Brazilian	2012	2018	3 (+ Hundreds AYA)	Once
34	FF	45-49	M	White British	N/A	N/A	10	80%
35	JB	40-44	M	White British	N/A	N/A	8	75%

36	BW	45-49	M	White British	2000	07/2019	3 (+ 4 changa)	Once
40	JA	35-39	M	White British	2014	10/2019	70	>70%
41	AV	45-49	F	Brazilian	2003	06/2019	20	100%
42	MS	55-59	F	Mixed British (Iraqi-Italian descent)	2013	2017	5	100%
43	DD	40-44	M	White British	N/A	N/A	Over hundred	>40%
44	DS	45-49	M	White British	N/A	N/A	Hundred	50%
47	ST	35-39	M	Nigerian	N/A	N/A	3	66%

Measures and materials

The DMT material was weighed using 0.001g microscales to monitor dosage. Given their experienced nature, ‘breakthrough’ doses were invariably desired by participants leading to a minimum dose of 40mg (max. 75), and mean of 54.5mg (*SD* 9.8) (a crude approximate equivalent of at least 30mg I.V. due to loss by exhalation, bioavailability and pyrolysis), inhaled via participants’ own smoking paraphernalia (almost always glass pipe. RH: Vape pen; DS & DD: ‘Dab rig’).

A detailed semi-structured interview was employed to explore the resultant DMT experience (see *Appendix A, 5.*). After recounting the experience as entirely and chronologically as possible, interview probes for elaboration spanned domains including entity encounters and visionary environments, as well as sensorial, bodily, emotional and cognitive experiences, corresponding (except the former two) to some of the major categories of the Hallucinogen Rating Scale (HRS), which was employed in the original studies of DMT administration (Strassman et al., 1994).

Procedure and anonymity

Given the class-A legal classification of DMT as a controlled substance, strict anonymity of all participants was held throughout. After reading of the online briefing, participants were given the option to consent (repeated again upon screening call and study day) and followed a link to book a timeslot to call a provided phone-number for the SCID-CT screening interview, and were advised to block their caller ID. During the call they were asked to provide their chosen pseudonym by which they were to be called for the study's duration. If they were eligible after screening, a mutual available time between subject and researcher was agreed to book when they plan to take the DMT, while establishing a meeting place from which to lead experimenters to their home or other suggested location agreed by researchers, to serve as the setting for the experience and study. In this way, no personal, identifiable information from the participant such as name, phone number or address was shared or recorded, and all reporting of data was anonymised. Naturalistic field research with psychoactive substances has previously been successful with ayahuasca and with neural and psychometric measures of DMT (Kuypers et al., 2016; Pallavicini et al., 2020).

Intensity ratings were asked of each participant (who stated their willingness to be asked) at 1 minute time-intervals during their DMT experience, on a scale of 1-10 (1=baseline; 10=most intense experience ever experienced). The SSI was conducted immediately after the subsiding of the DMT experience, as indicated by participants' indication of intensity being 1/10, and most often lasted at least 30 minutes (approximate range 12-75 minutes).

Analyses

Interviews were audio recorded by the researchers and deleted once uploaded to a secure cloud-storage system. All 45 (of 47, as two resulted in no experience) interviews were transcribed *verbatim*, including each of the 36 interviews reported herein. These were then coded with software package *NVivo* v. 12 (Windows).

The interviews were subjected to thematic analysis using a hybrid deductive-inductive process, wherein many of the eventual highest-order, overarching *categories* were based on, but not identical to, most of the major categories dividing the HRS (including "perception", "somaesthesia", "affect", "cognition"; Strassman et al., 1994). After this point

all analyses and coding efforts were in accordance with the guidelines as provided by Braun & Clarke (2006), as well as being purely inductive in nature with codes and latter themes elicited by the interview data only. Importantly for chapter 3, focusing on only a subsection of wider analyses (the 'Other'), this deductive aspect is not applicable here given the two overarching categories (elaborated in Results below) not being included in the HRS, and as such all analyses herein are inductively developed.

The extensively iterative thematising process predominantly comprised thorough re-reading of the narratives, the noting of preliminary concepts as initial codes which were then clustered according to thematic similarity into provisional but usually highly specific lowest-order *subthemes*. Such subthemes were then subsumed under the pre-determined overarching categories, and the process was repeated for each of the 36 interviews. The process of reviewing these many subtle themes, collated within the few broad categories, only until all interviews were coded allowed for more resolved identification of distinct or comparable concepts across the entire scope of interviews. This then led to construction of *super-ordinate* and even finer *mid-level themes*, both subsumed by the overarching categories but subsuming the lowest subthemes. Further refining processes included merging of redundant themes captured by other themes, or expansion of themes covering disparate concepts. Final naming of the themes, especially super-ordinate and mid-level, was decided upon once all subthemes were finalised to ensure a thorough capturing of total explored content.

When using the software *Nvivo*, the number of interviews (as separate documents) ascribed to each given code is automatically calculated. The frequency across the whole dataset with which each theme occurs is thus recorded, and this both serves to highlighting the repeated nature of many highly specific themes across reports. Finally, during the write-up, an idiographic emphasis was assumed by reporting many participants' accounts to extensive degrees, to illuminate the details of individual subthemes' content over and above the superficial, summated, and thus nomothetic, overarching categories.

Ethics

The field study and present analysis was approved by University of Greenwich Research Ethics Committee (Ref. 17.3.5.15).

Chapter IV: Thematic Analysis of the DMT Experience: An Encounter with ii) the Self

Participants, Materials, Procedure and Ethics

The same as the previous chapter, on account of representing a further analysis of data from the same field study of DMT use.

Analysis

Transcripts were subjected to thematic analysis using a hybrid deductive-inductive process, wherein four of the five eventual highest-order, overarching *categories* of the present report were deductively based on, but not identical to, most of the major categories dividing the HRS (including “perception”, “somaesthesia”, “affect”, “cognition”; Strassman et al., 1994). After this point, including the first category (“Onset”), all analyses and coding efforts were in accordance with the guidelines as provided by Braun & Clarke (2006), as well as being purely inductive in nature with *super-ordinate themes* and *subthemes* herein elicited by the interview data only (a sixth category comprises “Meta-narratives”, see *Appendix B, 1.*, which is itself also purely inductively developed).

Chapter V: Thematic Analysis of the DMT Experience: An Encounter with iii) Death

Materials, Procedure and Ethics

The component of the methods relating to the DMT thematic analysis are the same as the previous two chapters, on account of representing a further analysis of data from the same field study of DMT use. The separate components of *participants* and *analysis* below are different, as they relate to a thematic analysis of NDEs shared by Cassol et al. (2018).

Participants

Regarding Chapter 5’s comparison with the near-death experience, a summary of demographic information for the 34 patients providing written NDE narratives (data shared by COMA Science Group, explicated below) includes the following: 11 female (23 male); Average age at NDE, 48.2 years; Range of age at NDE, 15-72; Average number of years from

NDE to narrative submission, 10.2 years; Range of years from NDE to narrative submission, 1-51; Average score on Greyson NDE Scale, 13.4/32; Range of score on Greyson NDE Scale, 7-22/32; 3/34 narratives with negatively valenced episodes. All aetiology of near-death events were coma induced by anoxic conditions.

All narratives were originally written in French, where translation into English was facilitated in a four-step manner: i) Utilising the latest Microsoft Word translating tool, ii) accuracy assessed by the present author, semi-proficiently literate in French (*PM*), iii) Potential errors rectified by utilising Google Translate tool, iv) Final accuracy maximised by a sample translated by an independent fluent French speaker (*FD*), where accuracy was rated as greater than 95%.

Analysis

Transcripts were subjected to thematic analysis, in accordance with the guidelines as provided by Braun & Clarke (2006). The process was purely inductive in nature, with *super-ordinate themes* and *subthemes* herein elicited by the interview data only. The present analysis completes the qualitative analyses of the DMT experience from the naturalistic field study, with the thematic focus surrounding experiences of death and the near-death, and mystical experience.

The set of content items (subthemes) in the current report, alongside those of the previous two reports from the DMT field study (Chapter 3; chapter 4), are then systematically compared and contrasted in terms of presence, frequency and qualitative content with the raw data shared by the authors of a previously published thematic analysis of the near-death experience (NDE; Cassol et al., 2018). A marked expansion of this published analysis of the NDE, i.e. the addition of new items, was made in the current report via a similar method of thematic analysis employed for the DMT analyses. This was performed given the DMT analyses' highly detailed nature, where such expansion will ensure the most direct and accurate comparison. Direct excerpts will be quoted between the raw transcripts from both the DMT study and the near-death experience narratives provided, to provide a level of qualitative detail versus depending only on thematic items, permitting nuanced comparison on the level of qualitative content verses solely structural phenomenology (the former addressing variant, while the latter addressing invariant components e.g. Varela & Shear,

1999). Notably, this shared data of NDE narrative reports, intended here to compare qualitatively with the DMT experience, originates from the same laboratory (albeit *not* the same participants; COMA Science Group, UoLIEge) which shared quantitative data of NDE patients for the publication of *DMT models the near-death experience* (Timmermann et al., 2018).

To supplement as a quantitative measure, the near-death experience scale (Greyson, 1983) was also administered to participants of the present DMT field study. Results are then compared with the above mentioned, previously published comparison between scores on the NDE scale from a prior laboratory DMT study and actual near-death experiences (Timmermann et al., 2018). See Appendix C, 2.

Chapter VI: A Comparative Analysis of a Near-death Experience and Subsequent 5-Methoxy-DMT Experience

Recruitment

The author of the present thesis met the participant and was informed of the individual's experience with 5-MeO-DMT during an academic conference (*Beyond the Brain*, 2018). Upon asking if he was interested in taking part in a planned study to investigate the experiences of those with both near-death and DMT or analogous experiences, he requested this author contact his personal secretary. Participant information and a consent form was sent to the individual, and after acceptance a video-call was scheduled to undertake the interview.

Procedure

A semi-structured interview was held with the participant for the purposes of discussing the nature of his 5-MeO-DMT experiences, as well as focussing on their comparability with his initial near-death experience.

The interview duration was 1 hour 21 minutes. Interview questions commenced with "*Please describe in as much detail as possible your experience with 5-MeO-DMT*", with subsequent probing questions including, for instance, "*Was there any kind of sensorial or visual experiential structure as well [in your 5-MeO]?*"; "*Can I ask for an elaboration of what*

you refer to as the 'counterfactual'...?"; "I [also] wonder what your comments would be in terms of the threshold of no return that comes up with NDEs?" A more comprehensive list of questions can be found in Appendix D, 1.

The interviewee reported three experiences with venom harvested from the Sonoran Desert Toad and administered via glass pipe. These were at escalating doses, where the one deemed by him to be “the most significant” was focused on for the purposes of interview – though the participant also reported he found very “similar but more powerful effects at higher dose”. The date of this chosen experience was 1/21/2018 and the dose was 46 mg. The setting was described as “In a comfortable private home setting with close friends”.

Analysis

A thematic analysis (Braun and Clarke, 2006) was performed on the published NDE account as reported by the experiencer in a popularly published book (Alexander, 2012), as well as on the novel interview focusing on the latter 5-MeO-DMT experience. This was conducted using Microsoft Word, entailing the listing of many specific codes, which were subsequently collated into broader final theme headings, with this process being completed firstly with the NDE then secondly the 5-MeO-DMT experience. The analysis was inductive in nature, deriving themes purely from transcript data. Lastly, identifications of each theme’s presence in either one of the experiences, or both, lead to their final categorisations as either similar or different.

The participant was also asked to provide an indication on a given scale of how similar the experiences appeared, and the NDE Scale (Greyson, 1983) was also administered, with the participant answering as regards his 5MeO and, separately, his near-death experience. This quantitative add-on enabled a provision of a structured comparison of the generic, phenomenological structure, as a complement to the richer qualitative analyses.

Ethics

The present study, including the interviewing of near-death experiencers, was approved by University of Greenwich Research Ethics Committee (Ref. 18.5.5.17).

Chapter VII: Two Case Studies of Experiencers of Both Changa and Near-death Experiences

Recruitment and Sampling

Advertisements were posted on social media inviting participants who have experienced both DMT and a near-death experience to undertake an interview regarding their experiences, as well as published on the website for the International Association of Near-Death Studies (IANDS). An email was additionally sent to the already enrolled participants on a DMT field study (Chapters 3-5) inviting anyone for a subsequent study who has also experienced an NDE in addition to their DMT experiences. No specific exclusion criteria were used, and the only inclusion criteria included having at least 1 previous 'breakthrough' DMT experience and 1 NDE (which was confirmed by scoring 7/32 on the Near-death Experience Scale, Greyson, 1983), via some physical injury or illness (i.e. classical NDEs, to exclude anticipatory or NDE-like experiences). The present analysis reports on the only two participants who reported using *changa*. One, *DA*, was sampled from the DMT field study, yet excluded from the original reports e.g. Chapter 3, due to using *changa* versus pure DMT, and thus included instead herein.

Participant information and a consent form was sent to each participant upon contact, and after acceptance, a video-call was scheduled for interviewing (in *DA*'s case, only regarding the NDE, as the *changa* experience was already on record). As such, the setting of the experience for *DA* was his own bedroom during the field study, and the setting for *SR* was again his bedroom during his personal usage (not within the field study).

Procedure

Semi-structured interviews were carried out to reveal i) the detailed experiential content of both the *changa* and near-death experiences, ii) the participants' reflections on the similarities and/or differences, and – adding a more quantitative dimension – iii) ratings as to the similarity and belief in the possible endogenous role of DMT in the experience.

Interview duration was 1 hour 21 minutes (*SR*), 1 hour 46 minutes (*DA*). The initial request was for the description of each experience in full, before probing questions were asked for elaboration, where example questions included “*what were your emotional experience, you said it was pleasant?*” “*The [Buddha's eyes] were giving you this sense of reassurance to the point of sleep, but was there a communication in any subtle way?*”, “*...was there also this*

diminishment in your regular self?" A more comprehensive list of questions can be found in the Appendix E, 1.

Questions to quantify participants' perception of experiential similarity and possibility of biological implication of changa's pharmacology in NDEs were also asked:

Could you rate on a scale of 1-10 i) how similar your *changa* and near-death experiences were (where 1 = completely different, and 10 = identical); ii) extent of your belief (if any) in the production or occasioning of your NDE being due to endogenous psychedelic-like brain chemicals, such as DMT (where 1 = absolutely impossible, and 10 = absolutely definite).

The Near-death Experience Scale (NDES, Greyson, 1983) is the standard psychometric tool for measuring the NDE, totalling 16 items each rated 0-2 (high – low intensity), with a score maximum of 32 where 7/32 constitutes having a 'near-death experience'. The scale was found to have high internal consistency, split-half reliability, and test-retest reliability, and high concurrent validity. It was administered to each participant, and was completed twice, once regarding the *changa* and once regarding the NDE. This was to allow a numerical comparison and percentage similarity between states, where no inferential statistical analyses are possible (given use of 2 singular case studies).

Analysis

The interviews were transcribed in full and then summarised, where summaries are provided in the results below. A detailed content analysis was performed on each of the original, raw interview transcripts, where both higher-order and more specific features were identified from the NDE and *changa* experience. The presence or absence of each feature between the two experience types is listed in Table 6 and 7 (for each case study), additionally alongside their presence across the NDE phenomenological literature (i.e. not only the NDE experienced by the participant). This process was informed by Wilkinson (2000; cited in Braun and Clarke, 2006), which describes a *micro* approach to coding and content categorising, i.e., attending to fine-grained experiences, as well as incorporating a quantitative element – for instance, as in the present study, comparing the percentage of features common to both the NDE and *changa* experience (content frequencies, however, were not possible herein, owing to the use of 2 singular case studies).

Providing the experience summaries as well as a thorough delineation of features allows for a rich qualitative supplementation of the phenomenology relative to that more restrictively revealed by the psychometric data of the NDES.

Ethics

The present study, including the interviewing of near-death experiencers, was approved by University of Greenwich Research Ethics Committee (Ref. 18.5.5.17).

Chapter III:

An Encounter with the Other: A Thematic and Content Analysis of DMT Experiences from a Naturalistic Field Study

Introduction

Varieties of DMT Experience

Much of the following has been expounded in the literature review, under *The DMT Experience*, but is here summarised for the reader's convenience, specifically relevant for the nature of the present study on other worlds and beings.

In 1956, Stephen Szara became the first person to experience pure DMT, by self-administration, describing vivid and rapidly changing scenes. Subsequent studies gave the psychedelic to human participants, mainly patients, noting sudden and intense changes in perception (Sai-Halasz, Brunecker & Szara, 1958). It was not until Strassman's (2001) landmark study post-prohibition which then emphasised the many participants' otherworldly experiences with a baroque array of other beings. Timmermann et al. (2019) conducted a lab study most recently, exploring the relationship between DMT experiential subdomains and neurophysiological measures.

Other phenomenological studies, like Meyer (1992), via online trip-reports, referred to a transportation to a 'hyperspace' with other entities, and Shanon's (2002) anthropological research on ayahuasca, which contains DMT, described a realm populated with a pantheon of supernatural beings, both schematising multiple 'levels' of the DMT experience. Cott & Rock (2008) thematically analysed a survey of DMT experiences and identified nine themes: Hallucinations (visual, bodily, auditory); Veridical hallucinations (transportation to another world and encounters with sentient beings which felt real); Affective distortion; Distortions in time, space, and self; Spirituality (related to beauty, love, religious experiences, and insights); Familiarity (feeling of knowing the DMT space); Lucidity; Ineffability; and Extreme intensity. Lyke (2019) provided a detailed content analysis of online entity descriptions, while Davis et al. (2020) conducted a survey of 2,561 entity encounters during breakthrough doses of DMT, both quantifying the characteristics and functions of the entities. The

connections between these studies and the present analysis are explored in depth in the subsequent discussion section.

Rationale for the Current Study

The thematic analysis by Cott & Rock (2008) and the encounter survey of Davis et al. (2020) are significantly limited in the following ways: under-representation of the general population, respondents' self-selection – but primarily, small sample size (only the former case), relying on, sometimes triaged, narratives (instead of interview) or fixed-answers, retrospective reports resulting in potential memory bias (deterioration or elaboration), phenomenological (versus qualitative) analyses, inability of monitoring or regulation of not only dosage but set and setting, and potential contamination of the experience by use of other substances. The present naturalistic field study of DMT use aimed to address almost all of these limitations, by performing a large-sample, thematic analysis (including content analysis) of a discrete dataset of breakthrough DMT experiences with convenience sampled participants, extracting rich content by *in situ* semi-structured interviews (SSI) immediately post-experience. Also, contrasting with prior lab studies, Strassman's (2001) reports were based on unsystematic bedside notes after doses (albeit with a large sample size) ranging from 7-28mg I.V. DMT, and Timmermann et al.'s (2018) purely psychometric analyses ($n=13$) resulted from 7-20mg I.V. DMT with only a subset receiving high-dose – whereas this study aimed to analyse only high-dose breakthrough experiences. While the SSI's of this study are consistent with methods in qualitative psychology, it also aimed to employ the 'bracketing' technique (a central function of micro-phenomenological interviewing; Petitmengin, 2006, 2017; Timmermann et al., 2019). This allows for a provision of inductive pre-reflexivity, that is, encouraging participants to avoid judgements of experiences into predefined cultural categories (such as "alien", regarding DMT, which may otherwise lead to propagation of such memes) or confabulating by biased recourse to one's conceptual repertoire, and to instead attentively describe the constitutive features in one's own words.

The aim of the present study is to achieve, via the above improvements, a finer and more naturalistic resolution, and thus greater understanding, of the DMT experience. Especially, the nuances of the qualitative content of the experience, over and above the more gross phenomenological structure (such as Timmermann et al., 2019; see Petitmengin, 2006;

Varela, & Shear, 1999, for this valuable distinction e.g. the former being of a variable nature and the latter relating to more invariant processes). This is crucial given its increasing use amongst the population, and more importantly owing to the scheduling of the first clinical trials to administer this intense and fast-acting psychedelic to depressed patients (D'Souza, 2021; Steiner et al., 2020) as well as healthy participants (Liechti & Ley, 2020; Scheidegger, 2021). This analysis' particular focus lies in the 'otherly' phenomena evoked by DMT, of immersion into different environments which, crucially, gives way to engaging with non-self entities. This is later discussed in terms of similarity with other exceptional experiences, including possibly shared neurobiological mechanisms, all of which may have implications for therapy. While the psychedelic mystical experience has garnered most attraction as predicting clinical outcome (Haijen et al., 2018; Roseman et al., 2018), the profundity of the entity encounter itself has recently gained attention as to its therapeutic potential (Davis et al., 2020; Lutkajtis, 2020). Other themes, spanning the particular experiences associated with the 'self' (vs. other) such as psychological and emotional effects, including experientists' personal and ontological interpretation and impact, i.e. phenomenological features especially pertinent to DMT's therapeutic capacity, will be delineated in the subsequent chapter (chapter 4).

Methods

The following outline of methods serves as a summary of the recruitment, materials, procedure and analyses which were elaborated upon in full in the methods section relevant to this chapter under Methods & Methodology (Chapter 2).

Participants were recruited primarily through social media and were required to meet strict criteria, including having used DMT at least three times previously, possessing their own DMT supply, and residing within the specified UK regions. Exclusion criteria included previous psychedelic experiences with lasting negative impact, a history of serious mental health disorders, including substance abuse. Out of 64 prospective participants screened, 39 were included, leading to 47 DMT sessions. After removing interviews that didn't meet specific criteria, 36 sessions were analysed (See figure 1 for recruitment, and table 1 for participant characteristics).

The research was conducted with strict anonymity due to DMT's legal status as a class-A controlled substance. Eligible participants were provided with a pseudonym, and their personal information was never recorded or shared.

The dosage of DMT administered was carefully measured, with the minimum dose being 40mg, and the participants used their own smoking devices to inhale it. A semi-structured interview was used to explore the participants' experiences, with the conversation domains reflecting some of the major categories of the Hallucinogen Rating Scale (HRS).

Participants were asked to rate the intensity of their experiences at 1-minute intervals. Post-experience interviews were conducted as soon as the effects of the drug began to subside and lasted at least 30 minutes.

The interviews were recorded, transcribed, and analysed using NVivo software, with a thematic analysis conducted using a hybrid deductive-inductive process. The process involved noting preliminary concepts, which were then grouped into subthemes and categories. After the interviews were coded, they were re-read to identify distinct or comparable concepts across the scope of interviews. The software also recorded the frequency of each theme's occurrence across the dataset.

Results

The following table (Table 2.) presents all levels of themes to be described in the present study's qualitative analysis of the DMT experience – the two overarching categories comprising “Other beings”, and “Other worlds”. This is except all final subthemes, which are listed in Appendix A, 3., where extra clarificatory notes for many of the themes can be found. Figure 2.1 shows a graphical representation of these themes also (minus the subthemes; also available in Appendix A, 4.) Both in the tables and the ensuing descriptions of themes, **bold** signifies super-ordinate themes (e.g. **Role** of the beings); *Italics* signify mid-level themes (e.g. Beings as *Showing*). In the descriptions of themes only, final subthemes (e.g. Beings as ‘Presenter’) are flanked by ‘apostrophes’ (and number of participant interviews in which final subthemes are present, out of total interviews, are shown in parentheses).

Table 2. Thematic Analysis of the DMT Experience: An Encounter with the Other; Tabularisation of categories, super-ordinate and mid-level themes explored in the present article – See Appendix A, 3. for list of all subthemes

AN ENCOUNTER WITH THE OTHER

Themes	No. Interviews /36 (%)
<i>Encountering Other Beings</i>	
<i>Transformation of persons present</i>	7 (19)
<i>DMT personification</i>	5 (14)
Sensed Presence	
<i>Presences (No imagery)</i>	6 (17)
<i>Omnipresence</i>	5 (14)
Role & Function: Entities Fulfilling Elaborate, Inter-relational Purposes	
<i>Helping or nurturing</i>	19 (53)
<i>Showing or communing</i>	17 (47)
<i>Manipulating or controlling</i>	6 (17)
Appearance & Features: A Myriad of Entities Manifesting	
<i>Human</i>	6 (17)
<i>Other animals</i>	4 (11)
<i>Otherly Creatures – Non-human/Non-animal</i>	26 (72)
<i>Sentient structures</i>	9 (25)
<i>Specific features</i>	9 (25)
<i>Visual quality</i>	19 (53)

Demeanour & Nature: Entities as Magnificent, Mischievous or Menacing	
<i>Charming and Inviting</i>	20 (56)
<i>Other dispositions</i>	12 (33)
<i>Mischievous or Jestful</i>	5 (14)
<i>Fearsome or Menacing</i>	3 (8)
<i>Nature</i>	17 (47)
<i>Expectation of subject</i>	6 (17)
<i>Gender</i>	17 (47)
Communication & Messages: Entities as Instruments of Personal and Universal Insight	
<i>Communication mode</i>	14 (39)
<i>Messages received</i>	12 (33)
Interaction & Behaviour: Entities as Interfacing or Independent	
<i>Active involvement</i>	10 (28)
<i>Passive activity</i>	19 (53)

<u>Exploring Other Worlds</u>	
<i>Breaking through the veil</i>	8 (22)
<i>Emergence into novel reality</i>	21 (58)
<i>Navigation through space</i>	11 (31)
The Scene: From Natural to Artificial Worlds	
<i>Human Worlds</i>	6 (17)
<i>Natural Worlds</i>	10 (28)

<i>Artificial Worlds</i>	6 (17)
<i>Children's Worlds</i>	3 (8)
<i>Nebulous Worlds</i>	13 (36)
The Contents: From Organic-Mechanic to Abstract Objects	
<i>Organic objects</i>	16 (44)
<i>Technological objects</i>	8 (22)
<i>Infantile objects</i>	3 (8)
<i>Geometric objects</i>	16 (44)
<i>Symbolic objects</i>	6 (17)
<i>Miscellaneous objects</i>	14 (39)
The Quality: A Mixture of Textures and Transformations	
<i>Transforming or Exploding</i>	7 (19)
<i>Synthetic textures</i>	15 (42)
<i>Generic textures</i>	11 (31)



Figure 2.1: Categories, superordinate and mid-level themes of the present DMT thematic analysis

Encountering Other Beings

Thirty-four of thirty-six experiences (94%) incorporated an encounter of some nature with sentient entities that were experienced as beyond the self. These were highly complex dimensions to the DMT experiences, all of which involving characteristics such as a definable disposition, mode of interaction and most (twenty-nine, 81%) with individualised visual form. However, some participants did describe sensed presences. This may have been either discreet *Presences* with no imagery, as 6 participants conveyed, for instance JM reporting “other vague hints at characters...more areas which had personality”. Or as how 5 participants articulated, where the presence in fact felt more like an *Omnipresence*, for example SH invoking her understanding of tantric philosophy, “the Shiva principle is the kind of indivisible consciousness that is everything, that is also the manifest universe that's Shakti - so it kind of felt like that”. It is noteworthy that 4/5 of these last participants were of the

total 7 who at no point reported a more defined encounter accompanied by a visual form and behaviour. Additionally, 5 participants had a tendency to refer to *Personification of the DMT* itself, such as “the DMT was showing me around... it felt very feminine...pulling me into these vortices” (SH). Finally, 3 participants also experienced the *Transforming of those present* in the room in different ways, for example “you just melded in with this bright light and you became this angelic shaman kind of guy” (LR).

Role and Function: Entities Fulfilling Elaborate, Inter-relational Purposes

Each case of interfacing with these beings was also classified in terms of a specific role the majority of them played, reflecting their function and purpose while actively engaging with the experient: *Showing or Communing*, *Helping or Nurturing*, and *Manipulating and Controlling*. TM (Trip 2: 30-34y, M, White Romanian) reported a particular encounter illustrative of the first role *Showing or Communing*, reported by seventeen individuals and mainly comprising of beings acting as a ‘presenter’ (10; hereafter all numbers in parentheses are the number of participants out of 36 reporting this feature) usually of intriguing objects, and ‘focuser’ (5) of their attention upon them:

“A lot of very strange clowns...mechanical entities. *Very* cartoonistic. And again trying to show me something...

It was like a toy ...continuously moving and changing shapes and colors... [they would] push them in my face... and I could see every single detail”

TM continues to encompass the *Helping or Nurturing* function, the most often reported, by nineteen i.e. over half the participants, entailing the most benign aspects such as serving as an ebullient ‘playmate’ (5) or reassuring ‘soother’ (5):

“Floating, jumping around, very happy to show me those things, [and] that I’m there, but again I couldn’t play with them, that game that they asked me to do...

I’m paying attention to them...this entity was asking me to look at his toy, then another ask[ed] me ‘No, look at my toy, play with me!’ ... Very childish in what they were doing... Yeah, those entities calmed me down...their message somehow...gave me [the] impression that ‘everything’s ok, I’m in [a] good place, I don’t need to worry, I’m too scared for nothing, and let’s play with these toys!’”

The role of *Manipulating and Controlling*, in the minority at six reports, was very clearly conveyed by DD's (40-44y, M, White British) encounter with a Faerie-like entity who embodied the multifaceted 'trickster' archetype (Jung, 1969) (3) – that is, integrating other themes i.e. the demeanours of being mischievous and childish, as well as the activities of laughing and tempting – who was also an 'orchestrator' (2) of the DMT-space:

“A female face which was tempting me, which I'm kind of familiar with... Then, everything slipped, everything stripped away. As I was tempted in, lured in... and there was like a 'Hehehe', there was a mischievousness to it. She was definitely giggling, as if to say, 'This fucking stupid idiot here he comes again I'm gonna show him, Bang!'... She's beckoning with a sort of finger like this, going 'come in, come in', and I thought OK, I'm mesmerised, so I follow her in... This female entity is fucking all-powerful but at the same time very mischievous and jokey and infantile... So she's like, 'I'm the master and orchestrator of this whole situation, but I like having a laugh at the same time'... In that space it's almost like she came to get me, kind of knew I was coming – 'Come, come, come, giggle giggle, laugh, look at that, now you're here, now I just sit back and watch you!'”

He reveals at the end, perhaps paradoxically (apt to trickster territory, given the ambivalence and boundary-breaking of the archetype) a protective 'guardian' (4) manifestation of the *Helping* role as well:

“She wasn't a god-like deity...she was like a child God!... Sometimes very nurturing and maternal, very protective if she feels like I'm getting into bad, deep water”

Appearance and Features: A Myriad of Entities Manifesting

The ways in which participants articulated the overall appearance of their perceived entities, and the defining features and aesthetic thereof, yielded the greatest number of subthemes – 48 in total, all of which listed, alongside all other mid-level and subthemes, in Appendix A (3.).

Human beings were seen only in six cases, and only in two of these were they persons known to the subject – and of interest, both of whom were deceased. The great majority, twenty-six reports, composed of forms attributable in some way to some *Otherly Creature*,

that is of a non-human and non-animal nature. These infrequently consisted of more simplistic 'silhouettes or featureless' figures (5) – but 'humanoid' was the most common (9) generic shape to these creatures, mirroring their human experiencers, albeit with the vast array of inhuman manifestations. We have already met TM's (Trip 2) cartoonistic mechanical clowns, with 3 other 'jester' or harlequin-like entities also encountered, while some other entities assumed "insectoid proportions" (4), such as one "multidimensional moth-like structure" (MP).

However, TM's (30-34y, M, White Romanian) first DMT experience perfectly portrays a very colourful number of the elements of the *Otherly Creature* variation, specifically fusing 'octopoid' (4) and 'serpentine' (3) features while incorporating elements of elongation, popularly associated with the 'Grey- or Mantis-like' aliens (2):

"If I need to compare with something on this planet...they're like octopus, from...another planet. They had many similarities, like that long head...the scalp here was big... It's far from octopus, but that's the closest...

Long heads and faces... They didn't have the nose I think...they had a flat face somehow, maybe they had some holes under that mask... and their eyes were much bigger than normal... Yeah, I wasn't scared, it was like alien eye, [a] big one. No it was like an animal, lamb...feeling only kindness... Very long hands...

I could see very strange hair...very similar to very thin and long snakes, kind of snakes...long and moving by itself"

Sentient structures were observed in nine cases, objects normally considered inanimate were animated. The entoptic displays were sometimes considered 'sentient geometries' (3), described as "hyperdimensional...dancing lattices" and "unbelievable hyperintelligent geometry", while "boxes" (1) topped with "transparent interlocking mobius strips going round and round", and "computer symbols" (2) at the onset of the trip's "start screen" were additionally experienced.

The *Visual quality*, that is the texture with which these presences were furnished was also very diverse. 'Self-transforming' (as per McKenna's 'machine elves', 1993), a tendency to morph in a dynamic state of flux, was the most oft-reported, alongside being 'geometric' in aesthetic (8). Sometimes the geometric backlight of the DMT space itself informed the

entities' forms as if emerging from it. Of the 4 insectoid encounters, 2 were explicitly described as such; MP's moth was "made of the same geometry...but wire-frame", which was also 'hyperdimensional' (3), and ST's grasshopper-like familial beings were described as "if light was coming from behind the curtain, how you would see silhouettes... The flower of life overlaid over everything...I could see an entity coalescing"

The experient EM conveys the 'self-transforming' (8) nature of her "construction with a mind of its own...moving around, everything was changing inside", closely echoing RH's (Trip 1) living structure, a "honeycombed...massive building...evolving and changing". However, EM also qualifies hers by stating "it was like this massive machine that keeps everything together", referring to a further quality of being 'mechanical' (3) – and while not articulated as a sentient edifice, JM's writhing environment has resounding parallels: "lots of wheels, cog-like representations, things spinning in multiple layers... They would all speed up as part of a larger geometry...mechanical movement... fluid, like a wind you could see" – whose self-transforming machine world was, incidentally, inhabited by entities of an 'elf'-like mischievousness.

FF's (45-49y, M, White British) following encounter mimics EM and JM's above, in being apparently contained within the fluctuating "innards of a machine" (see *Artificial worlds, Scene*), but the populace therein had a peculiarly simultaneous 'organic-mechanic' (1) aspect to them:

"There is a recurring image of like a space invader figure, sort of like an icon... It was definitely...maybe your blood flowing through your system... These things...were the workings of something!... [They] were following along these sort of trackways which were doing something, part of a bigger, maybe it was keeping me or keeping something alive...like seeing the workings of possibly myself or the human form, being inside seeing it maybe from a microscopic perspective. But it was much more mechanical and sort of alien... definitely more spacey...

Interviewer: And that tiny scale might blur the boundaries of what looks organic or mechanical?

Yeah absolutely!... there's definitely life in there, or some sort of sense of being... It was almost like a 'marble run'...like roller coasters, loads of these track ways where these things were moving along them"

Demeanour & Nature: Entities as Magnificent, Mischievous or Menacing

As many of the excerpts already provided will attest to, the great majority of the entities with whom participants connected came in peace – their disposition cultivated a positive encounter, and sometimes overwhelmingly so. Over half of cases, twenty, involved *Charming and Inviting* beings; most participants used terms like 'benevolent' (10) – sometimes associated with healing the participant (see *Helping, Role*) – almost equally conveying them as 'benign' (9), denoting their friendliness while not quite as profoundly loving. A diversity of twelve *Other dispositions* involved beings who were intensely 'curious' (4), itself notably always co-extant with the former two temperaments. For example, these participants describe entities with both such qualities:

"There was...a sense of being healed, a sense of [the observers] working on my physical and psychic body, eliminating toxins. Very benevolent, some curiosity from their perspective... They were curious to understand what I am, what I'm seeking... All very benevolent, looking out for me" (MP: 45-49y, M, White British)

The next most commonly appraised demeanour, by five participants, was *Mischievous or Jestful*. However, as the inherent light-heartedness of the terms suggests, this does not preclude a warmer and playful character. This includes DD's described above, and SH's "fun and light" was underscored by "an edge" where there was "something about the presence that always feels slightly mischievous... Like it could take you somewhere really dark if it wanted to", and while JM describes that "there were hints that it could get dark" he caveats this with that "everyone was in a good mood, for whatever reason! It was quite jovial."

The only three encounters which had particularly challenging episodes (8% of total), labelled under *Fearsome or Menacing*, included two transient stages from RH. His third and last experience involved an emergence from "terrifying blanket" patterns of hundreds of closing-in "hooded dark creatures, forbidding, quite forbidding, scaring me a bit". Which was an apt judgement, given their eventually "saying something like, 'Don't go there! Are you sure?'...like a test or something. 'You sure, you sure? You can still get out of this!'" . It

remains ambiguous as to whether they were displaying a more protective role to RH, or as part of some trickster-ish agenda (implied by the 'test' remark), akin to DD.

Often, as per the broader *Nature* of these entities, participants described themselves as 'one with, or one of the beings' (10) – one stating “the entities were my friends, I felt they were like my sisters, they were telling me that I'm like them” (AF). RH's (55-59y, M, Asian British – Indian descent) third journey entailed an extensively tendrilled ever-evolving green-ish being of immense proportions (as did his second):

“Tough thing was that we knew each other so well, and I felt like I was one of them or something like that... I was much more connected to the body of it, the body and I were really close, like in an embrace of some sort, really close... I felt way more, much more like them than human.” (RH, Trip 3)

This refers to the same encounter in which he described such unity with the entities that they spoke and lived through him (see 'possessing', **Interaction**, Appendix A, 1.). Intimately dovetailed with this is that virtually all these reports of kinship also refer to a 'familiarity' (10) inherent in their relationship (that is, they are not familiar purely due to seeing them in prior DMT states), and two again describe the beings in a familial fashion as “seeming like a family [who] appeared around me for my lesson” (ST):

“We were doing something that we've done before...We know each other. We are these things or something... They absolutely love us...Just wonderful, delighted, at home! It's home” (RH, Trip 3)

'Hyper-intelligence' (7) was ascribed to the entities in several cases. RH (Trip 1) describes what he could only articulate as animal-like with circular pods on their heads:

“Yeah, hugely advanced...the difference in form, compared to this planet, that they were in just made me think this has to be a form of advanced [life]”

Communication and Messages: Entities as Instruments of Personal and Universal Insight

This super-ordinate theme encompasses explicit exchange of some form of understanding between the entities and the experient, evidenced by the majority of the beings. The *Mode of communication* was sometimes with the use of 'dance or gesture' (3), but for the most-part was purely 'intuitive or telepathic' (11), as RH (Trip 2) clearly conveys saying:

“I don’t think it’s the ‘I’ that I think with that’s doing this at all, it’s something else. Because I often notice that I’m already communicating – I’m aware now, I’m effortlessly communicating with this entity... It’s not language, it’s just a knowing, just a complete knowing. I tried to tell them what I was doing at one point in English, but it’s just pointless!”

Listed in Table 2, under *Messages received* are only the communications expressly verbalised by the participants and are by no means an exhaustive collection of all the subtle messages conveyed to each. These overt communications would be heavily associated with the aforementioned ‘teaching’ and ‘healing’ **Roles**; imparting to the subject of interpersonal guidance around ‘love for others and the self’ (5), entreaties for the person to ‘let go’ of suffering (3), ‘warnings’ (2) such as that ambivalently issued to RH, and another explaining ‘insights into the nature of the universe’ (1). The following, independent subtheme has been derived from this latter subtheme of universal insight:

The subtheme of ‘the Cosmic Game’ represents a constellation of profound communications expressed independently by 5 participants. Three of these had remarkably comparable messages; that the universe is a vast interconnected playground for beings to simply enjoy. AF (40-44, F, White Italian) is reproduced here, yet both her and SH were interfacing with a playful, flirtatious, feminine creature, functioning as both guide and teacher of such universal insight:

“Oh God, very very sensual. And this, like ‘it’s a game, its’ all a game’. They were playing with me, and they were like ‘come and play’. It was all a game, it was very very playful. Just enjoy... It’s like I’ve known them before, they were like ‘Yeah you know the game’, this is the relation. I know the game... They were showing me things. The main thing was this geometrical figure that kept changing shapes and colour. And they were...saying ‘Look what we can do, look what *you* can do!’. Very interacting, very interacting... These sensual females, they were like ‘Ok you wanna do this, Ok we’re ready, whatever you want to do, we’re ready’...

They were telling me that I’m like them and I have to enjoy the pleasure of this existence, and life is fun, and it is all about playing and enjoy life and all that life has to offer...

It was very liberating, and just like, let it out...just be... I had that sensation of just

existing... I just opened myself...even the crying was like Yeahhh, crying, just Ahh, let it go!...

It was showing me the things that exist. This exists and this exists, and they all had a pattern, they all looked like each other... They exist...in everything. We all exist in the same way. So there's no separation of things... Everything already exists and is it out there”

A further super-ordinate theme, **Interaction & Behaviour**, encompassing its respective themes and descriptions, namely *Active Involvement*, 28%, and *Passive Activity*, 53%, has also been analysed (see table in Appendix A, 3.). Owing to its close comparability to, and thus further refining of, the above theme covering the roles and functions of the entities, however, it has been inserted into Appendix A, 1.

Exploring Other Worlds

One hundred per cent did describe the concept of arriving at a qualitatively different space of consciousness or reality, characteristic of the so-called breakthrough DMT experience, and the major content of which is elucidated below. Smaller proportions variously reported more minor themes of *Breaking through the veil*, 22%, discovering their *Emergence into a novel reality*, 58%, and a *Navigation through the space* in which they now found themselves, 31% (see table in Appendix A, 3.). For an elaboration of these see Appendix A, 2.

The Scene: From Natural to Artificial Worlds

Entering into entirely different domains appears ubiquitous with these experiences, where the nature of this new world-environment took on myriad forms for participants: Weird worlds, yet betraying a familiarity, since within their transformed nature they may uncannily echo worldly experience (Shushan, 2018). *Natural worlds* recurred in ten cases, where those pertaining to a “space-like environment” (6) was most prominent. AZ saw himself “enveloped by a mystical black colour of the universe, inside of which there were an infinite number of geometric figures”, and SH (30-34, F, White British), alongside the emergence of similar shapes, relates:

“I pulled back and it changed into a blackness, kind of like pyramids, quite angular shapes, but like black with almost like stars or something, there was some white or gold bits in there... these dots that could almost be stars, which felt tied up in the astrology in the Egyptian ancient wisdom”

Natural landscapes (4) which may be recognisably earthly, albeit a divinised mirror-image, included RH (Trip 1) and EM which shared an environ of living mercurial structures, and were again paralleled in their visions of gardens of biblical proportions:

“The beauty...is just so intense... I don’t know what 5D looks like, but it was like that or more... A garden of extraordinary beauty, that [the animal-entities] were coming out of” (RH: 55-59y, M, Asian British – Indian descent)

“Actually, it had gardens as well, because I was remembering there, like Oh you can definitely go to the garden and see some other stuff, it has rivers and everything. It was just like one of those palaces from ancient Babylonian gardens or something, it was beautiful, and every single bit of the wall – you know like mosques have all these patterns and all these beautiful glass like stuff inside, that everywhere, on every single little bit” (EM: 20-24y, F, White Romanian)

Artificial worlds comprised of six cases of vision-scapes possessing a particularly unnatural flavour, but most simultaneously expressed using natural imagery. This was observed before with FF’s (45-49y, M, White British) icon-like creatures, which he again describes here as within a “mechanism” of some description (2):

“Like conveyer belts, but within conveyer belts, they were everywhere... there was definitely a sort of sense of almost mechanical conveyor belts of psychedelic energy... Very sci-fi... how the space invaders moved across the screen, in very basic computer graphics...

But beautiful, it felt like the natural order of things... There was a purpose to it! Yeah, they were up to something... Like this whole thing was like the innards of a machine... but maybe your blood flowing through your system”

Visited by three participants were *Children’s worlds*. TM says of his second experience that he was clowning around in a “playroom” (2), with “toys and entities and kids, someone just

threw me there and said play with these entities”. The first words of GR’s (25-29y, M, White Romanian) interview, who was greeted by a sticker-like cut-out clown, were:

“It was literally like...everything was like completely shifted into another way of interpreting reality... into like, a circus sort of!... It was very ‘circusy’, because of the hilarity of it all!”

After asking what it was about the hilarious quality that transposed into a ‘circus’ (1), he replies, echoing his moving through the space via its own hysterically impossible ‘folding’:

“Because reality was just shifting – like you know those books, when you take one page and then they create like a thingy, a 3D object... Like that experience of a universe folding and unfolding, like that. It was just hilarious”

Interviewer: Like the hilarity of the cosmos being distilled into a children’s playful pop-up book that you were being shown through?

Yeah, exactly! Exactly!”

Thirteen individuals expounded on, at least segments of their experience, being not so much well-defined worlds as much as a *Nebulous worlds*. One experient, OR (Trip 2; 25-29y, M, Brazilian), speculated he was witness to the etheric “fabric” of the world around us:

“There was a time where I see like, atoms and scales and the matrix, like buzzing *Chh, chh, chh*... this was like you know, what's the word, an ether...and it could just transpass [*sic*] me and everything... The fabric, like the fabric of what is this we see ...this [gestures to room around him] is a manifestation, *not* an emanation... everything’s just wave or formless, and this [gestures again] is more dense you know, frozen part of all of this”

Various articulations of finding oneself amongst ‘gridwork’ (9) were most common here, alternately described as “not quite a honeycomb... lattice-work” or “loads of intricate crisscrossing, like an amazing beautiful little spiderweb”. In both SH and GR’s very resonant experiences, there appeared a vast, devoid expanse, but one rich with potential in which objects were seen to materialise. GR’s lattice-like space represented a kind of cosmic template (2):

“I just did not exist anymore, it was just like raw data outside of me existing... In an infinite universe of raw information... [Like an] empty blueprint of the universe... Like this [points to mathematical paper] literally... it was a simple grid on horizontal, then a chalice there, but this was like one image out of a million [objects]... [It] was basically deeply knitted...like a fabric... So imagine this [sweater], but...with really big strings, but as if you’d make a huge cube out of it which was infinite”

The Contents: From Organic-Mechanic to Abstract Objects

As is the prolific nature of the content-full DMT journey, these other worlds are densely populated with a litany of articles and artefacts. *Organic objects* seemed to be the prevalent-most, aligned with the natural scenery (above) as being amongst the commonest, surveyed by sixteen journeyers. For instance, ‘plants and flowers’ (10) stemmed from such simple images “of a tree, big kind of oak tree with a swing in it, and then loads of birds singing” (JA), extending to more complex arrangements as AF’s (40-44, F, White Italian) floral, fractal encounter (much like BW):

“Some vase of flowers... And from inside there was this geometric shape, but they looked like flowers, like sacred geometry – and what it was really, was...a male entity in front of me... showing me a flow of energy, shapes, colours – flowers coming out his solar plexus... Everything he was throwing out of his body was related to one another and linked by shape and meaning”

Imagery of a ‘cellular or sub-cellular’ nature was also recounted (4), where two such experients expressly noted DNA. EM upon entering her “impossible... cube but hexagonal” (‘hyperdimensional structures’, below) was privy to “a cell or something...and loads of organelles... So it’s like a 3D hexagon, with an interior made out of cell-like structures, like DNA strands”. TM (30-34y, M, White Romanian), during his third time, upon being swallowed by a child, couched his double helix in the following terms, very analogous to the ‘organic-mechanic’ aesthetic reported by FF which he posited as a view inside biological machinery:

“I saw very strange DNA, but wasn’t DNA that I know, it was made by... It was like a chain, and in the middle they had...definitely a sphere with, they weren’t symbols, it was made of something, seems mechanical... I remember very well a sign... It was

intense red these things, and all of these were functioning somehow, like a mechanism, not a biological one, more mechanic... And everything with a note of cartoony. I wasn't sure if I was seeing inside a biological being of someone"

Descending ever further in scale, the 'molecular or subatomic' (3) revolves around "seeing all these different molecules... just everywhere were just collections of molecules and geometry" (JA), or in RH's case (Trip 3), initially speaking of a building, "like the girders inside, the structure inside something", yet qualifying that it "looks like in chemistry, the shapes of atoms". The elaborate-most exposition of this idea comes from part of ST's (35-39y, M, Nigerian) depiction of his hyperactive hypercube (see *Geometric objects*) – also verging on interpretations of a metaphysical ilk (*Meta-narratives*, as discussed in chapter 4 on DMT's effect on the self):

"When I stepped into it, it seemed like [the hypercube] was a fundamental thing in reality, almost like [the entities] took the smallest thing on the Planck scale for example...to maybe represent the scale, then you blew it up to show you that this *is* the way things are on the tiniest layer... This is what builds up everything!... It's like a computer screen or a newspaper, where they have a big image and then they have a close-up. Like a microscopic image of this whole thing and here's what's going on there...

It seemed the Borg thing [i.e. the hypercube] came in 3-dimensional space...everything else was shimmering...because it was in more high detail... I can actually see the finest definitions of this... It seems like I'm looking at this and I can actually see it inside-out almost, I can see the whole thing, like on a molecular level"

ST had also referred to his tessellating tesseract, in its rapidly rotating configurations, as like the "Autobots" (of the *Transformers* franchise), thus representing one of eight instances of *Technological objects* appearing. A sense of 'mechanics' and curious 'devices' were sometimes evident (4). Both AN and JM turn to cog-like imagery, the former describing her pressing up to her DMT partner's back as "a fusion of the spines and all the energy around them, like turning into one another, like cogs, like kind of twisting in... that central column entwining"

Lastly, 'satellites and spaceships' (2) were volunteered, where comparably to ST's hypercube framed as that from "The Borg" (of *Star Trek*) – so in precisely the same way does BB (35-39y, M, White British) paint his hypercubic craft as:

"you know, the Borg, and their cubes...it's a big spaceship and it's a cube, obviously not grim and grizzly like that. But a big cube that has a lot of detail within it, almost with little cutaways, and each cutaway is its own 3D space – and the whole thing, this 3D shape rotates, sort of spins, not slowly, almost as if some really cheesy American documentary is trying to make everything look razzmatazz and sort of sex it up, like *dumdahdumdumm!* Everything's moving, almost as if it's trying to catch your attention"

Such 'hyperdimensional structures' (6) recurred with noteworthy frequency, subsumed under *Geometric objects* presented to sixteen experiencers, where five of the six such hyper-structures being cubes of multidimensional proportions. Here, DD (40-44y, M, White British) fleshes out his feminine-faerie as puppeteering him through:

"a cube...the multiple dimension aspect of it was that she- it started off like 2D then it sort of slipped into this cuboid which then fractalated...

Interviewer: ...a cuboid, but more than 3D?

Oh mate, you fucking- absolutely!... as this cube sort of splintered off, and I was able to sort of look around the other facets of this cube if that makes sense... it was weird- it's such an understatement innit [*sic*]. So as this cube- she's lured me, and the cube is fucking sort of disintegrating in multiple dimensions at the same time... but that scene [of the woman and child] was the mirror in one of these shards of this cube that had just splintered...

The female entity that I'm quite familiar with, she then came back in this sort of multi-fucking-splintered multi-dimensional thing, and was giggling... the 2D square then broke into this sort of hyperdimensional cuboid fucking thing that just then exploded, and I sort of kind of went into it... then it just went fucking- accelerated into super crystalline- I remember looking at it and appreciating how unbelievably fucking impossible those lines are and that situation"

Virtually the only other geometric object, dissociable from the perhaps pervasive geometric patterns in DMT, appeared to be ‘spherical shapes’ (7). For example, TM’s (Trip 3) earlier organic-mechanic DNA mingled with a sphere, and others express similar impressions that “there were definitely balls there as well...like spinning balls amongst it” (DD).

Symbolic objects occurring in six total cases were signalled perhaps most vividly by TM’s experiences, especially his second immersion. For instance, in terms of ‘symbols or signs’ (5), many such signs to him represented medicine, alongside a “kind of cross or something in the middle, then borders like an arms crest” (TM 2). This echoes his first trip where “around that pill were floating four or five symbols” (a shuriken-like cross, large tree and swirls).

Similarly, ‘ancient language or hieroglyphics’ (3) were repeatedly observed, from “very, very Aztec...patterns” (RS), to TM’s (Trip 2; 30-34y, M, White Romanian) toys endowed by his clowns which:

“appeared like, Egyptian, maybe not, but hieroglyphical writings, that was a kind of paper, but it was floating like a papyrus but... Some of them were pictographic, some of them were hieroglyphical writings near [the toys]... Some of the toys looks like a Greek vase...I saw Greek motifs on some”

Again, TM’s (Trip 2) experiences continued in highly symbolic form, reporting the classic digital ‘raining code’ from *The Matrix* trilogy, as had one other journeyer – which was, for TM, manifested alongside a trinity of black holes (‘space’, *Natural worlds*):

“I saw codes, a lot of codes, walls infinite with codes. At one point, very fast, to form three black holes in those codes that were flowing all over. It was like The Matrix code, it was even green. Very, ‘MS DOS’ code... alien language, I couldn’t recognise those... crawling down and up, and some of them were attracted toward those black holes

Interviewer: So they were bending in space toward the black holes?

Yeah, yeah, yeah! And after that I could see...other kinds of codes, different language...and this one was somehow more complex, and it came like a typhoon

over me... So all my visual spectrum was codes, and they were green, and it was a black space. Bright green, neon green”

Apart from the aforementioned nursery and children’s book scenery, TM (Trip 2) is most representative of the three case’s *Infantile objects*. He here tries to comprehend his gifted toys, the gyrating gadgets which:

“were somehow alive, continuously moving and changing shapes, and colours... Some of them had fluffy texture, some of them were mechanic. Some of them some strange, very strange material I can’t define... at the second look, it changed very radically the form, it was something undefined, because morphing continuously... these bubbles transformed into the toys – they were very coloured, the colour became cartoonish somehow. They were starting- it was a screen-saver of Windows 98 with these kind of orbs changing shapes...from bubbles into the toys”

At least fourteen experiments offered up myriad *Miscellaneous objects*, perhaps more arbitrarily positioned amongst the vision. However, additionally to the snake-haired experimenters of TM (Trip 1) (and several other snakey entities) – who also added that “snakes I think they were one...or two of the symbols” – many other kernels of imagery had decidedly ‘serpentine or cyclical’ spins to them (7). Again, in his second session, TM rounds off his description of his intricate symbol-adorned toys, redolent of the medical insignia of the serpent-entwined staff, by saying:

“you know, the Chinese carnival, those kind of motifs, they were very similar... Some of them were boxes made by kind of dragons that were moving in that form...for example, the dragons had the crest and everything, red, blue, green, very colourful... This sign morphed from that dragon, Chinese dragon...because at first that dragon was moving on that toy like a snake, and protecting that toy, and the end of the tail it had a sign... for me it looked like a medical thing”

The Quality: A Mixture of Textures and Transformations

Pertaining to the kind of visual texture to the general world-space and its constituents – at least three of the five tesseract-structures were explicitly qualified as *Transforming or exploding*, including BB’s “rotating” or “spinning”, and DD’s impossibly “fractallating [*sic*]” or

“splitting” cubes. These transforming configurations have also been visited in four other instances, like during TM’s (Trip 2) clockwork-clowns’ shifting gifts.

Fifteen participants noted aspects aligning more with the environment’s *Synthetic textures*. Perhaps more *semi-synthetic*, most evoked was the (by now familiar) peculiar hybrid-aesthetic of ‘organic-mechanic’ (5), such as with TM’s (Trip 3) DNA-complex he “was looking to see if it was molecular or mechanical – and it was a mix, definitely!”. Again though, much of this *synthetic* quality in general pivots around the hypercube phenomenon – where both BB and ST analogised theirs as like that of “the Borg”, which is a contraction of ‘Cyborg’ (and in turn, of cybernetic organism). BB (35-39y, M, White British) elaborates:

“There was a woody quality to it. Bark-like. It’s never pure geometry. If you’ve got [at] one end of the spectrum, artificially, a 1990s fractal poster, to a tree and its fractal patterns – it’s sort of somewhere in the middle”.

Equally as many individuals reported a ‘cartoony’ or sometimes ‘animated’ quality to things (5). Resonating again with BB’s high-dimensional cube – also depicted as ‘razzamatazz’ (1) – ST relates that “it’s the Borg in cartoon... Imagine a *Rick and Morty* version of it. With every single component of it moving about and in different colours”, thus evoking another animated, space- & interdimensional-themed TV show. Finally, scenic finishes such as MP’s “super holographic, very digital looking” (3) world occasionally arose, which was also inhabited by a hypercube. Although this evinces artificial feelings much akin to BB’s or ST’s CGI-like, technological cubes – ST considered his as part of the substructure of reality, and MP in fact also qualifies his as “hyper-real”.

Discussion

The present analysis from high-dose (>40mg) smoked DMT in naturalistic settings yielded all 100% of the 36 experiences to include either contacting representations of another being, or emerging in a different environment (virtually always co-occurring), of some nature. The experiences of ‘breaking through’ to other immersive worlds, that are hyper-vivid, intricate and impossible, as well as interacting with other beings, apparently sentient, independent and familiar, have been retold from the original and revitalising human experiments with DMT, to the only other modest thematic analysis and very recent online studies of the encounter discussed below. Such experiences have been thoroughly reconfirmed by the

present analysis. Indeed, the frequent overlap of, often specific and nuanced, content between participants in the present study is testament also to the interesting internal consistency of the DMT experience.

Parallels with Major Studies of the DMT Experience

Shanon's (2002) categorisations, though pertaining to ayahuasca, also very closely reappeared in the present analysis, such as 'soul-flight' through the other realms, which may similarly be of natural or heavenly landscapes; ancient or magical cities; seeing Earth, outer-space voyages; amusement parks and circuses; mythological imagery, scripts and symbols, mathematical formulae, and biological evolution. As per the native populace of these realities, while animals were comparatively uncommon in this analysis, snakes, and serpentine beings and imagery, were also the commonest animal-motifs met. Saliently too, all the (albeit few) known human beings met were deceased – DMT echoing ayahuasca as 'the spirit molecule'. While shamanic-like spirit transformations were not directly reported, several participants did describe feeling 'one' with the beings encountered, and one transformed into plant-life (where two participants reported human-animal hybrids). Other strata of Shannon's phylogeny were again mirrored, including mythological-types such as other animal-hybrid beings or faerie-natured entities, ET or alien-types (like serpents, octopoids or insectoids, grey-like beings or Navis); beings divinely angelic in character and function; though entities of 'demonic' dispositions were barely encountered, where one subject reported a succubus-like figure and another a multi-eyed entity congruent with many religious depictions of beings of death, also elsewhere reported with DMT (Luke, 2008). Specific deities of particular religions or mythologies were *never* explicitly identified in this analysis – though overlapping qualities were certainly discussed (such as *Shakti*) – perhaps related to the bracketing (inherent to micro-phenomenology; Petitmengin, 2006, 2017), similarly encouraged in the semi-structured interview (see Methods).

The content analysis of discarnate DMT beings by Lyke (2019) – subtitled "Not everyone gets machine elves" – elicited highly similar findings to the present study's results. She identified that 75% of reports included at least one form of entity where 37% described more than one, though the present study in fact found 19% to have at least one and 75% with more than one. When using only her specified lists for comparison, comparing Lyke

first and the present analysis following, entities were much more likely to be female in Lyke versus twice as common in the present sample, and poorly defined/featureless (29% Vs. 22%), as well as humanoid beings (22% Vs. 25%) the commonest in both. Though more difficult to make direct correspondences, due to the splitting into nuanced and various subthemes in the present thematic scheme, Lyke listed divine (10%) followed by alien beings (8%) as the next most common, where those entities with obvious physical or behavioural attributes of an angelic or alien nature would also approximately follow next here (however the latter, e.g. Octopoid, Grey/Mantis etc, more prominent than the former, e.g. Benevolent, Beautiful – though, the categorical alien-angel distinction likely lies only in *appearance*). Lyke's categories then follow with elves/faeries (7%), animals (6%), then mechanical and geometric objects (6%), where similarly, all such entity types were found in this analysis – albeit reversed in frequency in the present (i.e. 3%, 11%, 8-22%), though here with elfish creatures defined only by appearance versus nature (e.g. Mischievous, Childish). Identically, voices (4% Vs. 3%) and faces (4% Vs. 6%) alone were the least most likely type.

Lyke and the present analysis again closely converge in relation to interactions with the encountered beings. All of her thematic labels were evident in the present framework (except for 'questioning', 3%) and the prevalent-most theme being 'showing, teaching or guiding' (25%) – equivalent to the roles of 'presenter' (28%), 'teacher' (25%) and 'guide' (14%) in this analysis. Similar order of prevalences included Lyke's 'love' as the 3rd most common (9%), with 'benevolence' being the commonest demeanour in this analysis (28%); 'observation' was the 5th most common (7%), with 'watching' being the commonest interaction here (25%); middling themes included 'excitement' (9%), 'reassurance' (8%), or 'play' (4%), which may correspond to similarly middling 'jovial' nature (11%), and 'soother' (14%) and 'playmate' (14%) roles here. 'Power/control' (3%) and 'sexuality' (3%) may correspond to the comparably minor 'orchestrator' role (6%) and 'sensual' demeanour (3%) here. Particular discrepancies however include Lyke's 'hostility' as being the 2nd commonest (10%), while the equivalent 'menacing' beings (8%) in the present study were certainly the *least* frequent – most likely a function of our participants' being accustomed to DMT and in a quasi-controlled space amongst quiet researchers (suggesting, even at breakthrough levels, DMT's sensitivity to 'set & setting). 'Reminding' was Lyke's least common (2%), whereas, though nebulous, virtually *all* themes within 'communication' herein, of insights

into relationships and the universe (3-14%), often had an essence of reminding inherent, and indeed familiarity with the entities was the commonest 'nature' herein also (28%). While Lyke reports no interaction (10%) as joint-second commonest, the vast majority of encounters here exhibited some role or interaction (14% minor/no engagement).

Parallels between this study's results and those of Davis et al.'s (2020) DMT entity survey include many of the same parallels with Lyke (2019). Though, one important difference between the present analysis and Davis et al.'s is that the latter employed mostly fixed, pre-categorised responses, meaning fewer and pre-conceived options versus the free vocabulary of this study's participants. Davis et al.'s most frequent selections included 'guide' (43%), 'alien' (39%), spirit (39%) or 'helper' (34%), where in the current analysis the Helping roles (53%) incorporating 'guide' (14%), as well as alien appearances (e.g. Octopoid to Grey-like, 6-11%) were certainly amongst commonest – though 'indigenous' or 'succubus'-like spirits were among the least reported (3-6%). Davis et al.'s next most frequent included 'angel' (16%), 'elf' or 'faerie' (14%, 8%), or 'religious personage' (11%), where again, angelic-resembling beings would also approximately be some of the next commonest types here (e.g. Benevolence, 28%) – though elf- or faerie-looking beings were of the *least* common (3%), and specific deities were not explicitly identified. Then decreasingly prevalent were 'clown' (6%) or 'demon' (6%), where 'menacing' beings were certainly the utmost least major demeanours herein (8%) – though, clown-like characters were actually one of the dominant (11%). 'Plant-' (10%) and 'chemical-spirits' (8%) were reported in Davis et al., where though highlighting shamanic-type motifs as found in our study (which Lyke had not), these particular descriptors were lacking here, as were 'animal-spirits' (7%) (except animals, 11%, and therianthrope-types, 6% here). To be discussed further in a subsequent chapter, chapter 5, relating the present analysis to near-death experiences – pertinently, both Davis et al. (1-2%) and this study found the deceased to be amongst the very least reported.

With regards to participants' interpretations of entities' natures, the majority of Davis et al.'s (2020) respondents endorsed 'benevolent' (78%) and 'sacred' (70%), where again 'benevolent' (28%) was the commonest nature in this study; 'all-knowing' (38%) was one of the next most selected, and 'hyper-intelligent' (19%) also being amongst the commonest natures here; and similarly 'malicious' was the least common (11%; contrary to Lyke), as it

was here (8%). Familiarity was 'slight' for Davis et al., whereas over a *quarter* described the entities' familiarity in this study – though notably about two thirds of the Davis et al. sample referred to their first encounter, versus the usually multiple past encounters in the present study (though again, almost all entities herein were novel, thus familiar for other reasons). Davis et al. also included having agency (54%), positively judgmental (52%), eternal (42%) and petitionable (23%), not directly coded here. 'Distrust' of the entity was reported by Davis et al. (10%), which may well align with the trickster-like beings of the present study (11%), those mischievous characters evoking ambivalence.

Davis et al.'s (2020) communications ('Message, task, purpose, insight' and 'predictions') transmitted to 69% of respondents were also similar to the present analysis's 'communications' theme; 39% of participants articulated messages though many more qualifying for communication. Namely, Davis et al.'s 'personal insight' (22%), 'love' (16%), 'reassurance' (10%), 'interconnectedness' (7%), 'death' (7%), 'knowledge' (6%), 'afterlife' (2%) – also, crudely, matching in terms of decreasing prevalence – correspond to this study's messages of 'insight into world' incorporating 'cosmic game' (14%), 'love for self/others' (14%) and 'letting go' (8%), as well as the roles of teaching (25%; and content of said lessons) and soothing (14%), and benevolent demeanours (28%). Specific 'tasks or purposes', as well as almost all 'predictions' about the personal or global future however, were decidedly *absent* herein. The vastly telepathic, then visual mode of communication was also shared in Davis et al. (74%, 40%) and here (36%, 6-8%) – though verbal (26%) and tactile (17%) were not present here. The encounter is finally reported as 'hyperreal' by the majority (81%), including causing significant ontological reorientations (80%) – as also identified in this study (mainly former; though reported in the ensuing chapter on effects on the self).

Echoes with Other Extraordinary Human Experiences

While *all* participants volunteered many basic features considered endemic to the near-death experience syndrome, as similarly found with a recent psychometric study comparing items of the NDE scale (Greyson, 1983) between near-death and DMT experiences (Timmermann et al., 2018), the similarity remained superficial in the present qualitative analysis of DMT content. To briefly short-list the generic near-death themes coded in the

remainder of the wider DMT analysis (not expressly reported here) which may correspond to the most frequent structural features across NDEs (Charland-Verville et al., 2014), these included – deep positive mood, bodily dissociation, bright light(s), deceased loved ones (albeit comparatively low), explicitly god-like beings or light-beings, and time transcendence. Also coded and aligning to traditional NDE-themes were tunnel-like structures, translocation elsewhere and a sense of dying.

Possibly the most comparable experience to the present DMT report in content and not only structure, is that of alien abduction. Many such as Mack (1994, 2000) have thoroughly documented this phenomenon, where Hancock (2005) has already found considerable overlap between them and ayahuasca and other shamanic experiences (and faerie folklore), and Strassman (2001) emphasises the alien abduction-DMT resonance. Here, very many themes are evocative of abduction, such as the entity roles of ‘presenter’, ‘orchestrator’, and especially ‘experimenter’, and the appearances of ‘insectoid’ & ‘serpentine’ beings, and particularly the ‘grey- or mantis’-like beings who although not reported in Davis et al. (2020) seemed present in two participants’ experiences here (admittedly, without the short stature or grey colour as per the former). An ‘intelligent’, ‘powerful’ and often ‘familiar’ nature; mostly ‘telepathic’ and ‘visual’ mode of communication, propensity of simple observation, and notably often ‘curious’, sometimes ‘urging’ demeanour were also highly reminiscent of abduction lore. The two experients in this study incorporating such themes and most resembling the phenomenon, would be TM (Trip 1) and MP. Despite suggestions of the laboratory environs of Strassman (2001) producing the abduction-esque scenarios (Luke, 2017; at least regarding medical-type procedures), this naturalistic study still yielded resonant themes in at least these two (albeit expectation may be a factor).

In a similar vein, parallels between faerie folklore (of the British Isles) and DMT experiences have been explored (Rushton, 2016, 2020), and compellingly demonstrated with ayahuasca (and other shamanic) experiences (Hancock, 2005). Those themes in the present study which are redolent of the ‘little folk’ have already been touched on above (in the reports of TM, DD & JM), also encompassing such appearances as ‘faerie’- or indeed, more commonly, ‘clown’-like; demeanours of ‘playful’, ‘childish’, ‘laughing’ or ‘bounding’ around, and not least ‘dancing’ entities (akin to the quintessential ‘fairy dance’ in the lore). The faerie phenomenon itself, however, has been cogently argued to be a progenitor of the

contemporarily stylised alien abduction experience (Vallee, 1969; c.f. Hancock, 2005), where both converge, for example, on a spiriting away by little humanoids (often with large black eyes) leading to experiences of subjugation, learning, or (not evident here) breeding. More precisely, for the purposes of the present DMT comparison, faeries/aliens have also been depicted as being 'trickster'-like, with 'mischievous' or deceptive inclinations – and as 'hyperdimensional', with such origins in hyperspace indeed speculated by others (Evans-Wentz, 1911; Jacques Vallee, 1993) – as have the DMT entities herein. Perhaps an exemplar of this elf-alien-DMT entity triad would be DD, with his childish (but powerful), faerie-faced, hyperdimensional trickster luring him through a tunnel and focusing his attention on screen-like shards. Importantly, a further prong to this trinity may be the spirits of the dead, taking us closer to the near-death experience. While the '*spirit* molecule's evocation of the dead was minorly revealed in the current report, faerie folk were considered entangled with spirits of the dead (Evans-Wentz, 1911) and the materialisation of the deceased may be more common than appreciated around alien abduction (Strieber, 2022).

Shamanic flights to, and animistic encounters within, other worlds has also been shown to have substantial consistency, not only with ayahuasca, but with DMT experiences (Winkelman, 2018). Briefly, some themes elicited in the current study and such shamanic experiences include entities enacting 'healing', 'teaching' and 'possessing' functions and actions, who may be in the form of spirits; the observing of realms composed of 'lattice'-patterns or other geometry, viewing inside the body, and molecular structures like 'DNA' or 'serpentine' imagery (e.g. Narby, 1998). Deep qualitative resonances between shamans' journeys and both faerie and modern abduction lore have also been evidenced (Hancock, 2005; Ring, 1992), in turn resonating with DMT reports herein. These entail the 'soul flight', communications intended for 'insight' into the nature of the world or relationships in it, such as the spirit realm or interdependence; as well as 'therianthropic' beings, or even the few cases of sweets in cellophane (RH; as offered by those in the 'spirit world'), a ladder toward light (AN), and a bible-like book (HV). The participants RV, JA and HV are mostly comprised of such shamanic elements – the latter two being the only participants who actively engaged with DMT in a ritualistic context.

Potential Neural Mechanisms

Of course, such echoing between DMT, near-death, abduction and shamanic phenomena could indicate a role for the endogenous psychedelic in each (qualitative evaluation of this regarding NDEs will come from a subsequent analysis). Alternatively, similarities may be owing to converging downstream mechanisms, such as default-mode network (DMN) disintegration (e.g. Winkelman, 2017), considered the gross neural correlate of psychedelic action by 5HT-2A agonism. For example, *salvia divinorum*, a Mexican shamanic herb and atypical psychedelic generative of disconnection of consciousness to immersive spaces, though stimulating the kappa-opioid receptor it similarly reduces static functional connectivity in the DMN (Doss et al., 2020). Neurophysiologically, such radical perceptual restructuring and ‘world building’ may be owing to collapse of alpha-beta wave, and dominance of delta-theta wave (Pallavicini et al., 2020; Timmermann et al., 2019) and forward travelling wave activity across the cortex (Alamia et al., 2020; Gallimore, 2020), evidenced at least by DMT.

In terms of the entity encounters analysed herein, and characteristic of many of these other altered states, Winkelman (2018) elaborates that the relinquishing of cortical control by structures like the DMN over hierarchically lower brain systems may release innate neural modules, key of which may be a ‘hyperactive agency detection device’ (HADD; linked to the faculty of mentalising), evolutionarily conserved to identify probable social agencies, and especially human-like agents in humans. This is also congruent with the anthropomorphic natures and behaviours to the present studies’ entities, including the most-endorsed ‘humanoid’ appearance. Timmermann (2019) has presented preliminary results from functional magnetic resonance imaging (fMRI) of the DMT state showing decreased connectivity in several intrinsic networks, including the DMN (consistent with previous psychedelic imaging data), as well as electroencephalographic (EEG) results suggesting inhibited alpha and elevated theta power, the latter across the temporal lobe (also exhibited by many dream-like states, Carhart-Harris, 2007). Such data also appear consistent with recent findings of baseline temporal (and frontal) theta oscillations inversely correlating with mystical experiences of unity and transcendence (Tagliazucchi et al., 2021), where presumably such a non-dual subjective state may preclude the dualistic encounter with a non-self ‘other’.

As per Timmerman et al.'s fMRI findings, similar DMN disorganisation is concurrent with alpha power attenuation over the posterior cingulate cortex, a key node of the network, under psilocybin (also correlated to 'ego disintegration'), where higher cortical alpha is otherwise thought to carry forward predictions (Muthukumaraswamy et al., 2013; Carhart-Harris et al., 2014). There is also evidence pointing to such predictive processing operating when exposed to biological motion and traits, thus applying to theory of mind (ToM; inferring about the internal state of another) (Koster-Hale & Saxe, 2013). In this way, theory of mind may be disrupted by DMT with the brain struggling to make the best prediction resulting in inappropriate interpretations of social agency. Regarding the above temporal EEG findings under DMT, it is likely that the release of the top-down constraining by the PCC (and DMN generally) of the medial temporal lobe (mTL) disinhibits the inherent driving activity of the latter over the former, with such freed intrinsic activity giving way to the psychedelic 'primary state' (Carhart-Harris et al., 2014) which may include as part of it ToM processes. For instance, mTL epilepsy patients show significant impairments in ToM (versus other epilepsy and schizophrenia subgroups; Broicher et al., 2012; Okruszek et al., 2017). Additionally, both the superior temporal sulcus and temporo-parietal junction are considered part of the 'mentalising network' (Aichhorn et al., 2009), where the latter as well as the medial prefrontal cortex (possibly unique to the human brain) are activated during social inference (Frith & Frith, 2000) – which, as such, may be similarly implicated under DMT.

Despite the above putative mechanisms, it still presents a challenge to account for the entity experience, especially given their manifestly baroque and highly profound (and reportedly 'hyper-real') nature evident by the present study. Generally, the novel statistical associations of the disparate, normally non-correlated, neural networks afforded by the intrinsic network disintegration and concurrent global network desegregation under DMT (and psychedelics generally, e.g. Carhart-Harris et al., 2016), may integrate into it the activated substrates of theory of mind in a broader synthesis, where such ToM activity may now 'drive' other neural systems such as the occipital and association areas, and the resulting subjective visual and social content is simultaneously available to conscious experience. This is also echoed by the 'phantasy' mode of consciousness, serving to construct a storyline-like narrative embellished from the data presented to awareness

(Horváth et al., 2018; Winkelman, 2018). That entities may be an end-stage result of the integration of the brain's disturbed capacity to accurately predict patterns in ambiguous stimuli and an aberrant agency detection, alongside the complex visual, often kinetic, fractal-geometric, imagery presented under DMT, may be consistent with the 8 participants herein reporting the beings to have a geometric flare to them. This said, this appears to be more the exception than the rule out of the 36 interviews analysed.

Consistent with Laughlin's (2000) model of the Jungian archetypes as being encoded into evolutionarily conserved 'neurognostic structures' in the brain, Stephan Szara, the discoverer of DMT as a hallucinogen, himself recommends looking for the origins of these entities "right in the brain", yet "deeper than conscious memories", further elaborating that such archetypes may be

"...stored in neuronal connectivity patterns early in development. What DMT might do... [is] let the Default Mode Network release the stored images and symbols into the perceptual system." (Gallimore & Luke, 2015 p. 11; Szára, 2014)

Therapeutic Potential

The fact that the DMT experience is clearly evocative of all the above classifications of experiences also has central implications for its therapeutic potential. For instance, the near-death and abduction (or UFO) experiences are shown to increase ecological connection, spiritual worldviews (Ring, 1992; Groth-Marnat & Summers, 1998; Mack, 2000) and decrease death anxiety (Greyson, 1992; Bianco, 2017; Mack, 2000), while NDEs also foster connection to oneself and others (Groth-Marnat & Summers, 1998; Pim Van Lommel, 2002) – all of which have been shown or proposed to mediate enhanced wellbeing in psychedelic settings (Kettner et al., 2019; Davis et al., 2020; Moreton et al., 2020; Watts et al., 2017). Additionally, as supported by Davis et al. (2020), the interpersonal and transpersonal insights received during DMT entity communication in this study suggests therapeutic capacity, in light of various studies indicating psychotherapeutic effectivity being attributable to psychedelically-inspired psychological insight (e.g. Belser et al., 2017; Watts et al., 2017; Gasser et al., 2015). Similarly, ontological implications of encounters with seemingly other-worldly beings who are hyper-intelligent, familiar and sometimes omnipresent, may be associated with elevations in psychological flexibility, which have in

turn been evidenced or suggested as a therapeutic mechanism of the psychedelic experience (Davis et al., 2020; Watts & Luoma, 2020).

All this said, although the vast majority of the encounters amongst seasoned DMT users herein were extremely positive, for less prepared and more vulnerable naïve and/or patient populations these same psychological ramifications related to ontology and the sheer intensity could well be challenging and yield adverse effects. Similarly, the precise relevance of the present study's resultant experiences, using such experienced users in their habitual settings, thus with likely differing subjective content, for any therapeutic application of DMT with naïve populations may be undermined. Even so, there is extensive anecdotal evidence of the same specific themes recurring even amongst first-time DMT users (Luke, 2017), the unique richness of the content elaborated in the present study should still be of significant guidance to any party involved in DMT's therapeutic research or use – and while experiences herein may be less challenging due to home environments, the presence of guides or therapists in therapeutic contexts should also be beneficial.

Distinguishing Features of DMT

It seems that there is virtually no single experiential feature of the above thematised DMT experience which cannot be found in either the alien abduction, faerie lore or shamanic, especially ayahuasca, experience. However, there may be a select few which may be more unique to the DMT trip itself (possibly with ayahuasca, given DMT as, arguably, the major constituent). For instance, beings here described as clowns or clown-like (though perhaps finding their analogue in the faerie folk), or otherworldly environs as playpens or circuses – for instance, both articulated by GR; as well as entities with a decidedly mechanical or indeed an organic-mechanic quality to them (though UFOs also, for instance, have actually been described as having biological (Kripal, 2022) or animal-spirit dimensions (Luna, 2022)), or realms expressed as the inside of a 'mechanism' – again both expressed by FF. The repeated phenomenon of the hyperactive hyperdimensional cube (DD, ST, AF, BB, MP) may also be considered a preferred trope of DMT, as well as the raining code iconic of The Matrix (TM Trip 2, HV); as might the 'razzamataz'/garish, retro game or even holographic-digital style. In short, prototypically infantile, synthetic or, unsurprisingly, psychedelic imagery. The current report's cellular-molecular or skull-skeletal imagery are not typical of faerie or

abduction literature, though may well be found in certain shamanic contexts (including ayahuasca).

Limitations

While there have been a number of improvements by the current study on previous studies in their analysis of the DMT experience, not least its focus on content, prospective nature and in-depth semi-structured interviews, various limitations are still present. For instance, similarly to, though improving on Lyke (2019) and Cott & Rock (2008), over three quarters of participants were male, and roughly equalling Davis et al. (2020) slightly over eighty percent were Caucasian, thus decreasing generalisability to the general population. However, Caucasian males are the main DMT using demographic (Palamar & Le, 2018). The present report also involves an improved age-range (23-58 yrs).

Additionally, the present sample were affected by a degree of self-selection, imposing certain selection bias, given participants' likely volunteering due to typically experiencing more elaborate, meaningful, and even positive DMT trips. A stringent screening procedure was also employed, involving the inclusion criterium of at least one breakthrough DMT experience as well as other DMT or analogue experiences, meaning that participants were not naïve, usually having vary many past trips (see Table 1.). This is a salient point, given the present study's focus on experiential *content*, and content's sensitivity to psychological history (Hartogsohn, 2016). More novice users may well have reported qualitatively different experiences, for example as suggested by Davis et al.'s (2020) finding that most respondents reported their *first* entity encounter as their most memorable. Such a narrowed sample is tantamount to the recruitment of a specific 'subculture', characterised by exposure to and interest in certain media, both fictitious and that regarding DMT research and 'lore' – which may well prime participants' 'sets' and expectations. At least one way this may have contributed to the resultant phenomenology is the comparatively high rate of entity encounters in the present study (94%), contrasted to Strassman (2001) finding approximately half of the *high* dose participants reporting this main feature (Luke, 2013), only very few of whom had previously taken DMT. How this may have affected the content itself is very difficult to untangle, even if comparing against a hypothetical (and improbable) study amongst entirely psychedelic-naïve individuals. This said, a key boon of using such

'psychonauts' is their deeper acquaintance with the DMT-space and lack of ontological shock expected of first-time users. This was not only a matter of ethics in avoiding unpredictable and possibly alarming reactions, but would have allowed a calmer, attentive and exploratory stance during the experience, thus returning having extracted, and able to articulate, more of its phenomenological essence. In a similar vein, the majority of the sample's nationalities being British (with some different ethnic descent), and most of these White British (see Table 1.), may also have shaped the content of the experiences presented here. While a comparative analysis of the content differences between nationalities (or ethnicities) is beyond the scope of this study, future research would be of interest to illuminate this contextual sensitivity of DMT experience.

Finally, as to the relative control of the present study – the substance used was not tested for its genuinely constituting *N,N*-DMT, nor for purity, and was always of plant-extract as opposed to laboratory-grade synthesis as used in the only two laboratory studies to date (Strassman, 2001; Timmermann et al., 2018). In spite of this, doubt can be minimised given that participants were seasoned DMT users intending breakthrough experiences attesting to the quality of the sample, as well as the researchers' understanding of the appearance of the substance, and not least the resultant phenomenology of participant experiences being highly concordant with other lab. studies' reported DMT experiences – as emphasised in the above discussion. Additionally, the setting for each participant was not a closely controlled laboratory environment, and as such the different physical contexts between participants may well have influenced the resultant experience (Hartogsohn, 2016). This said, the naturalistic nature of the study meant participants undergoing the DMT experiences in their regular environment (own homes or gardens) with only researchers present, thus introducing a level of standardisation. Also, the uniquely stimulating setting of lab. environments, though more homogenised, equally present a host of experiential primes which may have limited such studies (Luke, 2017). In this way, this degree of regulation of substance and setting, made possible by the present field study, was markedly improved compared to other major DMT studies using only online surveys or forums (Davis *et al*, 2020; Lyke, 2019; Cott & Rock, 2009).

Chapter IV:

An Encounter with the Self: A Thematic and Content Analysis of the DMT Experience from a Naturalistic Field Study

Introduction

“What is it like to be” on DMT?

Much of the following has been expounded in the literature review, under *The DMT Experience*, but is here summarised for the reader’s convenience, specifically relevant for the nature of the present study on DMT’s effects on more personal experiences (distinct from Chapter 3’s focus on the Other).

Sai-Halasz et al. (1958) was the inaugural study on DMT in humans, finding altered perceptions, depersonalisation, "ego loss/amnesia", and both euphoria and anxiety. Boszormenyi and Szara (1958) and Turner and Merlis (1959) gave DMT to psychiatric inpatients, with comparable results described in a similar psychiatric framework. Strassman et al. (1994), decades later, conducted a major study with 60 participants, using the Hallucinogen Rating Scale divided into six categories, such as somatic, sensorial, cognitive, etcetera. Another perspective by Strassman et al. (2008) described DMT experiences in three dimensions: The Personal, the Transpersonal, and Invisible Worlds. Timmermann et al. (2019) provided a neurophenomenological report, correlating first-person experiences with electroencephalographic data. Other studies attempting to delineate the phenomenology included Meyer’s (1992) analysis of online DMT reports, categorising them into initial shifts in consciousness and vivid 2D geometric patterns.

The present report on the DMT breakthrough experience, and especially Chapter 3’s attention to the experiencers’ incorporation into other worlds, have explicit relevance for the neural substrates of ‘disconnected consciousness’ – described by Martial et al. (2020) as subjective states without experience of the external world, that is, internal conscious content while dislocated from the immediate environment.

Rationale for the Study

A detailed rationale for the naturalistic field study of DMT upon which this chapter is based is outlined in Chapter 3's first qualitative analysis. In contrast to the focus in that report of entity encounters, the analysis in the present report is dedicated to the experiential domains pertaining to the *self*; that is, a breakthrough experience not into 'other worlds', but into the inner world.

Continuing investigations into the DMT experience are necessary in light of growing popular use (Winstock et al., 2014) and rapidly growing interest in administration of DMT for psychiatric purposes (e.g. D'Souza, 2021; Liechti & Ley, 2020; Scheidegger, 2021; Steiner et al., 2020; Devlin & Bhatt, 2022; Erritzoe et al., 2020). Importantly, the present study provides systematic improvements over most of the significant limitations of previous survey and laboratory research on DMT (Cott and Rock, 2008; Lyke, 2019; Davis et al., 2020; Strassman, 2001; Timmermann et al., 2018). Improvements included utilising only breakthrough experiences; which were in a quasi-controlled setting; immediate semi-structured interviews; which used 'bracketing' inspired by the microphenomenological technique (C. Petitmengin, 2006); and qualitative versus phenomenological analysis revealing detailed content in lieu of generic structure (Varela and Shear, 1999).

The present analysis' *self*-associated themes, particularly in the emotional domain, are especially pertinent for the compound's therapeutic capacity. Possible neural mechanisms are also explored, offering an indirect corresponding between phenomenological features and objective neural correlates. Finally, the nature and degree of DMT's mimesis of the near-death experience (NDEs; Strassman, 2001; Timmermann et al., 2018), and potential for neurochemical contribution, acts as the primary focus of chapter 5.

Methods

The following outline of methods serves as a summary of the recruitment, materials, procedure and analyses which were elaborated upon in full in the methods section relevant to this chapter under Methods & Methodology (Chapter 2).

Participants were recruited primarily through social media and were required to meet strict criteria, including having used DMT at least three times previously, possessing their own

DMT supply, and residing within the specified UK regions. Exclusion criteria included previous psychedelic experiences with lasting negative impact, a history of serious mental health disorders, including substance abuse. Out of 64 prospective participants screened, 39 were included, leading to 47 DMT sessions. After removing interviews that didn't meet specific criteria, 36 sessions were analysed (See figure 1 for recruitment, and table 1 for participant characteristics).

The research was conducted with strict anonymity due to DMT's legal status as a class-A controlled substance. Eligible participants were provided with a pseudonym, and their personal information was never recorded or shared.

The dosage of DMT administered was carefully measured, with the minimum dose being 40mg, and the participants used their own smoking devices to inhale it. A semi-structured interview was used to explore the participants' experiences, with the conversation domains reflecting some of the major categories of the Hallucinogen Rating Scale (HRS).

Participants were asked to rate the intensity of their experiences at 1-minute intervals. Post-experience interviews were conducted as soon as the effects of the drug began to subside and lasted at least 30 minutes.

The interview transcripts were analysed using a hybrid deductive-inductive approach. The overarching categories derived from the the analysis were mostly based on, though not identical to, the major categories from the Hallucinogen Rating Scale (HRS). Besides the first category in the present analysis ("Onset"), all analyses and coding followed Braun & Clarke's (2006) guidelines, via an inductive approach where the themes and subthemes were purely derived from the interview data. A sixth category, "Meta-narratives", was also developed purely inductively.

Results

The following table (Table 3.) presents all levels of themes described in the present chapter's qualitative analysis of the DMT experience – the overarching categories comprising Onset, Bodily, Sensorial, Psychological. and Emotional. This is except final subthemes eliciting specific content, which are listed fully in the table in Appendix B, 2.,

where extra clarificatory notes for many of the themes can be found. Below is a graphical representation of these themes (also minus the subthemes; which is also available in Appendix B, 3.). Both in the tables and the ensuing descriptions of themes, **bold** signifies overarching categories (e.g. **Onset**); *Italics* signify super-ordinate themes (e.g. Sensory). In the descriptions of themes only, final subthemes (e.g. ‘Submergence’) are flanked by ‘apostrophes’ (and number of participant interviews in which final subthemes are present, out of total interviews, are shown in parentheses).

Table 3. Thematic Analysis of the DMT Experience: An Encounter with the Self; Tabularisation of categories, super-ordinate and mid-level themes explored in the present article – See Appendix B, 3. for list of all subthemes

AN ENCOUNTER WITH THE SELF

Themes **No. Interviews /36 (%)**

<i>Onset: A Tumultuous Transition in Self, Space and Time</i>	
<i>Sensory</i>	14 (39)
<i>Emotion & Body</i>	15 (42)
<i>Space-time shifts</i>	10 (28)

<i>Bodily: A Blissful Disembarkation from the Body</i>	
<i>Pleasurable</i>	10 (28)
<i>Neutral / Both</i>	8 (22)
<i>Uncomfortable</i>	9 (25)

<i>Sensorial: A Kaleidoscopic Blossoming and Blending of the Senses</i>	
<i>Open-Eye</i>	11 (31)
<i>Visual</i>	27 (75)
<i>Cross-modal & Other</i>	14 (39)

<u>Psychological: In Inarticulable Loosening of the Psyche</u>	
<i>Memory & Language</i>	31 (86)
<i>Awareness & Sense of Self</i>	18 (50)
<i>Time distortions</i>	13 (36)

<u>Emotional: A Soaring Angelic, and Fathoming Hell, of the Soul</u>	
<i>Positive</i>	34 (94)
<i>Neither / Both</i>	22 (61)
<i>Challenging</i>	6 (17)

<u>Meta-Narratives: Co-creative Insight into Heart and Cosmos</u>	
<i>Mind-Manifestation</i>	30 (83)
<i>Ontological and Emotional Breakthrough</i>	27 (75)
<i>Transitions Through Time</i>	20 (56)

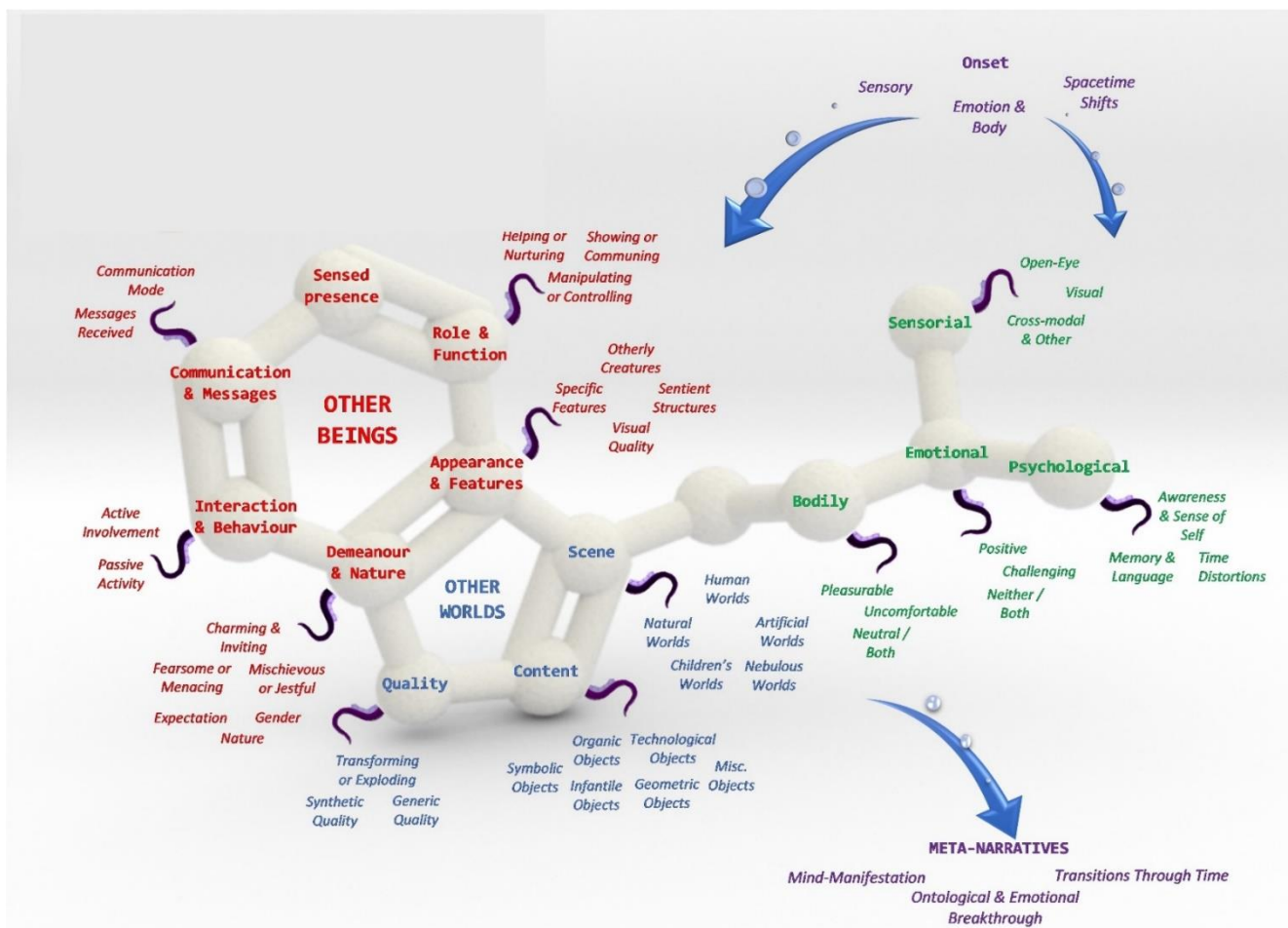


Figure 2.2: Categories, super-ordinate and mid-level themes of the present DMT analysis – also including those of *Encounter with the Other* (Chapter 3)

Onset: A Tumultuous Transition in Self, Space and Time

Several themes have been duplicated to appear both in their natural position (such as under Sensory, or Psychological) and again under the category of the Onset of the DMT experience, the latter representing those elements which some participants volunteered as the earliest they can recall.

Sensory

Fourteen participants (39%) described significant *Sensory* events at onset, such as sensations of ‘submergence’ (9) resulting from the sheer experiential deluge at the brink of the DMT breakthrough. Thus, LR uses the terminology of there being “many, many ideas and many things coming flooding through”, and TM (Trip 2) articulates that “it came like a typhoon over me”. In his third experience, he reinforces the metaphor:

“The first part happened too fast, really, too fast, the images were overflowing, I couldn’t understand anything... It was like I was in the middle of a tornado,

everything was going at unimaginable speed, I couldn't follow anything... maybe a sensation like I was drowned – drowning, but in colours and images”

AN's experience was “slightly oceany in the feel” where she “felt submerged...I felt underwater in some way, or contained by an energy”. This is again redolent of ZD's (30-34y, F, White British) submergence, who also felt she was *within* some entity:

“[it] felt like being at the bottom of the swimming pool, like hearing someone stood on the side, saying ‘how intense is the experience?’. Yeah, it felt like there were so many layers of things going on at once...that my brain could just not handle it. I was just in so many different experiences at once...

it was really chaotic, and exhausting...it felt like I was being battered around by loads of different competing currents, some of which trying to make me go deeper, and some trying to bring me out... energy streams trying to take me in different directions”

‘Geometric patterns’ (6) were reported to clearly emerge around the trip's very beginning by a minority (much fewer than expected from literature or anecdote, but may be artefactual from many others not volunteering explicitly). RH (Trip 2; 55-59y, M, Asian British – Indian descent) describes this progression from colourful (basic) patterns through to more iconic (complex) imagery:

“It started with softly opening up patterns, like very beautifully coloured blankets...but then all of a sudden, into the ‘death’ bit... it would start off with orange triangles, that seemed to open up [into] – would you call it geodesic? – more 3D. Then something beyond! Then out of it would come entities, out of this very fracturedness, I'd be in this completely other world”

Emotion and Body

Immediate sensations in both *Emotion and Body*, the emotions being of such intensity so as to be bodily manifest, were offered by fifteen participants (42%). Some commented on a mild ‘fear or anxiety’ (4) such as “being a scared monkey into this reality” (GR). Several subjects entered more the domain of ‘terror or panic’ (6; three of which belonging only to RH). Of important note, 5 of these 6 experiences were associated with a fear, or mostly

sensation, of dying (see chapter 5 for an analysis of DMT's mimicking of the near-death experience), and many of these in turn concurrent with trouble breathing (potentially related to the DMT vapour). Illustratively, in the "horrifying, terrifying, horrible" moment of RH's second trip he discloses that:

"I had the terrors for a while because I was in a fairly new place I didn't really recognise, very startling... I remember fighting for breath, thought I was going to throw up at one stage... it's hard to go past the fear in the early stage, a lot of terror...

I was panicking a bit because it really felt super intense... I was really worried...that I wasn't coming back or something... dying at the beginning, pain, confusion – that really was fucking powerful actually... I seemed to be in what felt like death really"

To further labour the theme of 'laboured breathing' (7), again alongside deep fear and felt threat to life, ZD here fleshes this out:

"I wanted somebody to rescue me. Fuck, that was so horrible... I felt like I'd lost my breath or something, like a horrible feeling in my chest... I had this sense that I wasn't gonna survive it, a sense of being in existential crisis which I've never had before. God...

it was absolute panic in my heart... And I had this sense of there being something outside of me or something outside the experience that could save me, and I don't know whether that's humans – or that's something else"

'Pain or torture' (2), ever more challenging than above but still coupled with mortal danger to ego, is illustrated by TM (Trip 3) uttering that "it was a pretty tormenting experience. I didn't know what was happening, why it was happening, who am I!?!... I wasn't aware of myself"

In terms of instant alterations in bodily awareness, alluded to by TM above continuing that it was "like I was falling down", GR (25-29y, M, White Romanian) was alone in expressly reporting a physical expansion (1):

"in the heart space, sort of a melty, clammy, gluey sensation, just like *whoosh*, you know like how snow melts... Yes, it was like a small sponge [there], then got more

spongy – and that transcended my body...it just started to expand beyond my parameters”.

Only a minority (though repeated in the literature) reported ‘the rush’ sensation (5); an adrenal-like response such as the “heart...going ten to the dozen” (BB) and “heat which is rushing through everywhere” (EM), accompanied by an “acceleration feeling at the beginning...like going over a rollercoaster” (JM) – but here divorced from any panic. For example, MP simply proclaims a “a kundalini hit at the base of my spine”, and TC relates “energy is rushing from my body and kind of radiating almost”.

Space-time shifts

Reports pertaining to rapid *Space-time shifts* were given by ten participants (28%), the most within experiences of ‘time dilation’ (6; vs 13 reporting similar distortions pervading the entire trip), such as RH’s always being thrown into the throes of dying in a void-like scenario which feels “ridiculously long, like, *forever* long”. Sometimes this temporal expansion entwined with the initial inhaling, as ST (35-39y, M, Nigerian) continues:

“after I blew out the smoke and it reverted to normal breathing, instead of letting it go on I began to participate in it, because it seemed so slowed down into so many different steps I could step in at any time”

The dissolution of immediate surroundings, the ‘breakdown of reality’ (4) presaging an entry into a new one, is grasped by JM’s assertion that “it’s very much a deconstruction feeling, things kind of peeling apart if you like”, or BW confirming a “streaming away of sort of trails...the visual field becomes less and less complex, and more bold outlines and then silhouettes then basic block colours”

While the vast majority described a sense of some translocation from the worldly to the otherworldly (see chapter 5 for NDE-like themes), a few insisted they weren’t “going through a tunnel or anything” but rather “just *Bang*, there... arriving ‘immediately at this scene’” (4) (MP).

Bodily – A Blissful Disembarkation from the Body

Participants did not generally elaborate on many experiential changes within the body, as most in fact stipulated feelings of disembodiment (see chapter 5).

Pleasurable

The majority of statements here, by ten participants (28%), were *Pleasurable* in kind, stretching from ‘pain relief’ (2), which can be quite striking such as TM (Trip 1) divulging that “because of fibromyalgia, I have almost continuous pain in my joints...after 3 or 4 seconds, it completely disappeared”, or MS’s aches and pains which “go away completely... You’re not in this world, you’re in this other world...[where] you’re sort of pain-free, *everything*-free, aren’t you!?” up to the unadulterated body-bliss of ‘ecstasy’ (4). BW (45-49y, M, White British), here, embodies more of a “post-orgasmic” (1) aftermath :

“Like *eeeeh-boosh!!*. And then all that jerkiness afterwards was like the comedown from having just ejaculated... It felt sexual in as much as it feels like it peaked, then post- now I’m just kind of this dribbling, jelly-like twitching thing”

Neutral or Both

Eight cases (22%) mentioned body experiences of a more *Neutral* type (or either pleasurable or uncomfortable). The spontaneous making of ‘religious hand signs’ (3) such as “instinctive mudras” (JA), or “dancing, moving with this shape, and I notice I like to do [these signs] when I’m in this space, to [the entities], with them. And it does remind me of sort of Hindu mudras” (RH Trip 2).

In both TM’s first and second time he convinced himself of having ‘convulsions’ (3), purely subjectively, as he “was seeing myself here on the sofa...I had seizures for like 10 minutes in my trip!”, or other contortions which he reconstructed in the interview “even more than this, like *The Exorcism*, like bent over... my body reacted...very violently, and I wanted to apologise”.

AZ (25-29y, M, Israeli), sitting in his garden, was the sole participant to feel himself transform, in his case into plant-life in an act of apparent ‘phytanthropy’ (1):

“Then all of a sudden I could see the entirety of myself placed as the heart of a tree... I could see branches coming out of my torso. And on each branch there were beings

that resembled a bottle with legs, and they were marching back and forth infinitely. Weirdly enough, I could feel all of their movements inside of me”

Sensorial: A Kaleidoscopic Blossoming and Blending of the Senses

The sensorial domain of experience is drastically transfigured in the psychedelic DMT state, but this category is concerned with the predominantly visionary experiential components.

Open-eye

Open-eye visuals, noted by eleven participants (31%), were either prior to their immersion into a separate space (see Chapter 3), or when fleetingly opening the eyes. A further ‘reality break-down’ (3) was witnessed – sometimes a ‘pixilation’, as in TM’s (Trip 2) case where the researchers “were very pixelated, with big pixels...you were like a very old video game from 70s. Worse than that!” MS (55-59y, F, Mixed British – Iraqi-Italian descent) both saw her fairy-lights “morphing into...loads of skulls”, and gasped that:

“Oh my god, there was like a flow! Freya [MS’ dog] was moving, she was like the energy flow between me and [DMT partner]!... vividly moving...energy between us all. Because everything breaks down- you all break down into something or another”

Another particularly eye-opening impression communicated by GR was very ‘clairvoyant-like’ (2), in the sense of wielding an experiential prowess uninhibited by the regular senses:

“each individual atom of that particular information which I’d received from the outside world, was just like – you could go into it as much as you want, or go out of it as much as you want... every pixel of everything was more like a tunnel...and I could choose to go through it, and just choose where to go. It was like a complete freedom in that way...”

So this [chest of drawers] was actually...transported into a huge field of minute atoms or something. But I could go in it or outside it... this [carpet] was more like I could see through it, so like instead of it being a thin layer fabric it was more like something huge and I could go and see each detail of it”

Visual

Changes in the *Visual* domain (eyes closed) were offered up by twenty-seven interviewees (75%), This was the fifth most commonly reported super-ordinate theme, largely in the colourful kinetic geometric-fractal dimension (virtually quintessential in the literature), with several of our DMT visionaries invoking a “kaleidoscope”. The ‘geometry’ (16) often defied description whatsoever, DS matter-of-factly retorting after being asked if he could describe them, “Not a chance”. Similarly, BB blithely comments on “their intricacy and the fact they’re infinite and all that”, and MS stresses that “it’s a busy other world and shapes and fractals and just absolutely mind-boggling!” More than the enrapturing aesthetics of these forms, their being of a sentient quality and united nature with oneself (see Chapter 3) is succinctly accentuated by RV (40-44y, M, White British):

“I was transported into precisely the place that ayahuasca took me on the previous journey. A place of unbelievable hyperintelligent geometry and shifting forms... it’s so, so difficult to describe. But it’s colourful, it’s everywhere, it’s moving, it’s very, very precise, it’s very form-full – and it’s *you*, you know! You kind of realise that, whatever it is, *you* are too”

This initial fantastic display is often the membrane, penetration through which affords the experient their ‘other-dimensional’ venture, as in JA’s (35-39y, M, White British) case:

“It’s almost like you’re being pushed through this tiny gap in the geometry that you have to sort of go through to come through to the other side. Then I was sort of twisting and going into it and coming through it, and then I knew – OK, I’m here now”

The geometrics were prominently of ‘fractal’ design (11). AZ, again highlighting their sensible or interactive properties, informs that he “could somehow manipulate them and feel them...all I could see was these strange patterns of sacred geometrical figures which were infinitely drawing more geometrical patterns out of themselves”. RH (Trip 1; 55-59y, M, Asian British – Indian descent) sketches the potentially overwhelming saturation by this multiplicative effect:

“everything was going back that way, down up. And not just that, every single part of it was fractalizing, there was nothing to hold onto, nothing I could grip, or do anything. Everything was just expanding from every point, no end to it”

The significantly kinetic energy of both the geometric-fractals and the other world at large, i.e. a state of 'flux' (13), may also often preface a suddenly more stable or static other world. This is pithily gestured to by BB, expressing "it was just crazy crazy crazy visuals – BANG, this thing and just this thing". Notwithstanding, many others' entire scenes continued to be charged with this dynamic nature where "there were a million things happening, switching from one to another" (GR), such as JM's flowing tapestry of ever-gyrating cog-like structures, FF's teleportation into a wildly bustling biomechanism, and the dynamism of EM's fluid machine-like construction – all resonant with the mechanoid *and* organic imagery (see Chapter 3). One explication of this effect was given a poignant spin by MS, around her vibrant, fractal skeletal motifs:

"That's what it taught me, the impermanence of everything. And everything's moving, nothing stays still. Nothing. That's what it really, really tells me a lot...and the sooner we realise it in this reality, the better the place we'll be

Interviewer: ...you've also got all this mortality imagery as well, so is it like our lives are transitory?

It's exactly that, exactly what it is. We're only here for a blip, and death isn't a bad thing"

Again, implicit in the ineffability of some of the patterns seen (and often in the more iconic visions) is their occasional 'hyperdimensionality' (8). RS riddles us that his "very intricate...dancing lattices" were "at least 4-5 spatial dimensions... sheets blowing in the wind – but hyperdimensional bedsheets!" GR describes a mind-bending folding of his awareness through impossible angles, and RH (Trip 1) witnesses a garden which was "so much more than anything 3D", where such emphatically peculiar spreading of space is valiantly rendered in words by both SH and JM:

"one bit where it kind of turned like *Voowwp*, and went kind of angular, a bit ketaminey when you kind of go, *Žžžž* and you shift into weird dimensions, or things change size or you become a different format...it was almost like I had become small and underneath a piece of furniture or something? This is *not* what it was like but the best I can try to describe it" (SH: 30-34y, F, White British)

“All this spinning, all this disorganised space that you can’t quantify in 3D space... It’s not necessarily linear... things spinning in multiple layers of things. It’s very hard to describe in space terms... everything made sense wherever it was, even though it wouldn’t make sense in a normal situation” (JM: 35-39y, M, White British – Scottish)

Cross-modal and Other

Further to the purely visual, *Cross-modal and Other* sensory features were conveyed by fourteen experiencers (39%). ‘Sounds’ appearing during the experience, versus at the onset, did not seem very common (4). MS describes something of a more continuous sound, “*Rauuuughh* – there’s this sound!... a sort of sound that came with it, like *Rrrrrrnngg*? Weird... A frequency vibration sound... every DMT trip I’ve ever done it comes with it”. ST (35-39y, M, Nigerian) adds to his “Borg cube imagery” that it also possessed “accompanying synaesthetic glitchy sounds”:

“The hypercube was like a placeholder for the many such images I’ve...seen projected by [Video-Jockeys] to accompany tracks. The same quality of glitching that...populates psytrance DJ sets... there would be this coupling of the sound to the image and then my brain, my mind would kind of follow it and be like 'yes yes yes!'”

ST here introduces ‘synaesthesia’ (10), appearing to be experienced by a significant number. Here it is of a visual-auditory-type, while next he seems to describe a somatic-visual complex with cognitive-affective components; a hypercube vision corresponding to his experience of difficult breathing, and indeed to his self:

“It’s almost like I’m seeing what I’m feeling... it was that same process of teaching me to associate the feeling of...this ‘autobots cyborg’ thing, that I could visualise as my experience of Me... it’s almost like watching yourself being sliced into a billion different pieces...

Seems to be more like a multidimensional movement going on, different type of components that all appear to still be connected doing this kind of movement... it seemed to be a process where it’s saying, ‘Imagine this represents you’, and then that realm, that imagination immediately makes it represent me, such that whatever

is happening to *it* I am feeling, or rather is transmitted to whatever part of my experience”

Of note, ZD (30-34y, F, White British) additionally discloses some dynamic relationship of her breath feeding into the geometric visions – in turn also associated with her sense of self:

“I became really conscious of my breath...I can almost see it... very aware of the breath as all this geometric stuff starts happening and it’s like the breath is *visualised* as a pillar in the centre of it all, and it might be like...a white thin line in the centre of it all, and it’s expanding and contracting as I’m breathing, and then it sort of blips into nothing – and then that’s where I disappear”

Psychological: In Inarticulable Loosening of the Psyche

Memory and Language

As per the cognitive repercussions of the breakthrough, faculties of *Memory and Language* were impacted dramatically, as exclaimed by a full thirty-one participants (86%). As strewn through all the above, very many found their journeys so out of this world as to be “*really hard to put it into words*”, where they usually mandate some ‘recourse to metaphor’ (19), and as evident throughout similes are also heavily relied upon by subjects. Though, even this isn’t without caveats, as ZD exemplifies that “it’s just so subtle, that if I use a certain word it will be really misleading”, DS fails to express “this thing here in the middle, whatever the fuck it was, I wanna say it was a serpent but it wasn’t a serpent in any way”, and SH’s words about her “beautiful patterns” let her down as they were “all, *Vvrrr*, coming around these rooms- they *weren’t rooms*, but rooms”. When asked to attempt the medium of drawing instead, RH (Trip 2) admits “I will, but I’m concerned that this human mind would distort [the entity]” which he witnessed as being “a bit octopusy, but that would just make it very- you can almost forget that”, as well as JB’s retort that his trips are “more a feeling, sort of sensations. I just feel if I try to draw, I’d be rationalising it and the wrong side of my brain’s gonna be trying...” JM sympathises too, where an ephemerality of the memory of the experience impedes its capturing: “It’s really hard to memorise, isn’t it? It’s just so abstract, you’re clutching at things that you thought you saw!”

'Temporary memory loss' (15), that is *within* (vs. after) the experience, pertains for instance to subjects' suspension of their short-term memory, like the knowledge of being in a psychedelic experiment, especially at the trip peak (minute 1-2). EM, for one, attempted to "keep the question in mind and remember that you're a research subject' – but I kind of didn't after a split second". Many others resonate with this, but importantly too alluding to a profounder interruption of their selfhood, a diminishment in one's longer-term autobiographic memory (similar to an 'ego-death' effect, yet without an explicit *loss* of the individual perspective, and also without concomitant mystical features), such as SP poetically painting the picture of becoming a blank canvas, where he "just came to...with the feeling of, it sort of becoming from nothing. There wasn't much in between. Nothing. Like waking up – without any dreams". FF also thought-provokingly recounts that "I wasn't really aware that I *didn't* know who I was... kind of like 'Wow, here we are, let's just observe and swim and just take it!'"

This occluding of one's prior conceptions of personhood and world is reinforced by RH (Trip 3), convincing himself even in his trip that "there's no way I'm gonna even remember this, I'm completely in another world, with only a tiny remembrance there's a human world going on as well". And GR (25-29y, M, White Romanian) evocatively explains that:

"I didn't even know if you were real or not, or is this real life or not, or reality or not... There was no reference point, no nothing... what would have brought me to have seen more to it would've been...if I were to keep my eyes closed – but I didn't have a conception of eyes, so it's very hard..."

So I remember thinking, 'Where am I!? Is this going to end? When is it going to end?'... Because I lost my memory, or what I did, or the fact I took DMT – that did *not* exist, that information was not there anymore... As if I'm just like teleported without anything from the past...into a place, *Peeww*, just like, 'What the fuck!?' – I mean, I still had my language capacity!"

Accounts of 'looping' were given on a few occasions (4), such as BW's (45-49y, M, White British) complex replaying mix of mental imagery (which was also highly synaesthetic):

“it was so weird that it was...like an OCD-type intrusive thought that kept popping into my head... almost as if I was still talking to you, like I was sober... the intrusive thought was a recent memory of a recent episodic thing...

The loop kept bouncing in. It was like ‘what the fuck was that’, and ‘did you all see that!?’ And then it’s like...did I actually say that? Then it went, then it popped back in and then... ‘Did you all see it as well?’ Then it’s like, but what *is* that!?... Then it’s like, I’ve actually lost my mind, I’ve lost the power to know the difference between talking and thinking...

that really weird feeling of transparency, almost like a schizophrenia-type, am I saying it or thinking it...? ...And then this sort of realisation that actually, I’m probably not talking at all, and this is all in my head... ‘They’re gonna think I’m crazy’”

Awareness and Sense of self

The most salient alterations within *Awareness and Sense of self*, itself noted in eighteen cases (50%), involved a more infrequent retention of ‘lucidity’ (5) – the sense of ‘preservation of ego’ or sense of self (as contrasted to the above, more common, loss of self-related autobiographical memory). AB emphasises that “I was always aware that I was me and that I was having a DMT experience...but reality had completely been replaced”. LG, although he was “dead in an icicle” and his “[etheric self] went into another plane... I was still me – my thought processes still felt the same... slowly I was like ‘I *am* dead’, but my ego was still here, so death is like...not that big a deal!” This staying within selfhood is sharply juxtaposed to dissolution of ego, the latter explicitly verbalised to a greater extent (see appendix C for chapter 5 regarding mystical experience). An ambiguity however, or even fluctuation between these states is suggested by JB (40-44y, M, White British):

“I was quite kind of lucidly half there, half here at points... Didn’t have any sort of- feel like I met any external entities – other than a Oneness, an Everything entity, a Universal entity...God, or whatever... I was kind of *in* it...”

Interviewer: But did you have a sense of you own identity still?

That's what I kept on laughing at myself that I did – in a way... I felt totally [unitive]... there was a certain self-awareness still. I don't think I completely lost myself"

Emotional: A Soaring Angelic, and Fathoming Hell, of the Soul

Positive

DMT incites a profoundly emotionally pervasive experience. As viewed by thirty-four (94%), that is, almost *all* the experients – and despite the somewhat frightful experience onset – it becomes an overwhelmingly *Positive* one. The trip was most often noted to be simply “very pleasant, very calm” (16), “really safe...so secure” and “so harmonious”, for instance for EM it was “such a smooth trip, so nice, so lovely” to be amongst her “community of harlequins”. TM (Trip 3), admitting that though he “was coming from that torment in the beginning” suddenly “it was very peaceful... I was almost expecting to hear birds singing!” This “bumpy ride” at onset being replaced by a more tranquil, “friendly kind of visit” is shared by numerous participants, such as JM (35-39y, M, White British – Scottish):

“if you're not getting a bit anxious when your head's falling about, there's something wrong with you – but beyond that rush at the start it was friendly... very comfortable, little bit warm and fluffy... I was smiling”

The welling of 'loving' feelings from the participants, and experience of 'connection' with others (10) was oftentimes deeply engendered. This may be associated with the mutual love generated between experient and entity, such as RH's (Trip 3) uttering, still communing with his entities, “Oh I love you so much, it's like we are one thing. Oh, I love it here so much!”. In BB's (35-39y, M, White British) vision he encountered representations of his wife and son, which struck in him an epiphany of the essence of the agape love-form:

“the feeling...of intimate connectedness with other people which I crave – desperately... It's the kind of feeling that encompasses one type of love which is in all the participants equally. So it's not as if, he's a kid who feels one way about me, and I feel a different way. No, it's just one shared form of love...crystallised into this kid figure”

The following two evoke an engagement with a greater consciousness, from whom they could not wholly unembed themselves (echoing the dynamics of selfhood above) – their reflecting on which caused tears to stream from their eyes:

“Wow. Just love. I don’t know what to bring back from that. Woah... it was not so visual...not so cerebral, just this utter sort of all-bodied sort of connection... and just reminding myself, that ‘I asked for this’, and that I love you all, and that I love everything, and fucking- How much trust, and love- [begins to cry, and laugh]...

I...shed some tears, but tears of beautiful- very happy tears, laughy tears. I kept laughing at myself for thinking about myself as “I”. My mind would say something like, ‘I love it, I love everyone’. I was like ‘I’m still there, I’m still saying “I” love everything, I’m still stuck on this “I”!’ (JB)

Though there is less levity, RV’s (40-44y, M, White British) pathos-filled account was also hued with striving to embrace letting go of the self amongst his similarly heart-opening encounter, here referring to the loving life to which he aspires:

“It would be something much more fluid, about a much more spontaneous expression of love on a day-to-day basis. It would be about hugs, and about blessings, and giving, about never hoarding, never requiring [begins to cry]... I have actually thought about being a priest...someone whose job is blessing and love and giving and modesty and gentleness and slowness [crying, hugging interviewer]... That is why we're *here* isn’t it?...

Yeah, and there’s this feeling that if I release my heart-centre, then my life has to change... to be...some kind of vehicle for love. I feel like I can be, but I’ve just resisted it my whole life, you know...

Interviewer: ...You’ve got a big heart [RV]!

Yeah, but it’s what we do though to shut it down”

The term ‘beautiful’ is one of the commonest positive descriptors thus far volunteered, sometimes in connection to the aesthetics – but more deeply evoked by the encounter or mystical-type experiences, where the co-resonant ‘profundity’ (14) captured many experiences. FF (45-49y, M, White British), despite going in with the intention of “sorting my

bloody head out” and ending up as “just a spectator of this alien phenomenal environment”, resolves that it was one he:

“felt privileged to be seeing... I’m blissed. I feel *blessed* that I’ve had this opportunity to go there... what's lovely with these things, is the profoundness of it is in itself an insight, and then that...leads to maybe helping with the intention...if you work on yourself”.

JB resonates with such otherworldly beauty and profundity being fundamental in its own right, despite not necessarily receiving immediate, practical answers:

“I was in another world... Yeah, it was full on, beautiful. Just totally blissful... But it leaves me wondering like, ‘What else?’ Or kind of, ‘What do we do with that?!’ Yeah, but in itself it’s just a powerful experience. To remind me of the abstract nature of reality, made me kind of feel this different universal plane. Which just feels really profound, and really beautiful to remember”

Basking in such supreme profoundness on occasion elicited feelings of great ‘humility’ (3). RV, here, manifestly wrestles with the ultimate truth of the accessed realms in stark contrast to the egoic self, which in turn is sometimes not strong enough to incorporate such truths upon returning:

“And it was so astonishing, and so humbling! And it feels so ridiculous in a way, because there you are [makes squirming noises] just a tiny struggling ego... anything that's truthful for me has to connect to the truth...of this reality of what's presented [in the trip], and you know, these dimensions beyond waking consciousness...and all their manifest healing... And really anything less than that- the fact is my life *is less* than that... as yet I’ve not made my life about bringing that truth to humanity. I resist *that*, and that's what the last ayahuasca journey was about as well, was to stop resisting *that*; this *is* of ultimate importance. This is of ultimate importance – but it’s *so* disorientating”

Eloquently further parsing out his ‘cosmic giggle’ (see *Cosmic game*, Chapter 3), and mirroring FF/BB’s sentiments of welcome unexpectedness, BB (35-39y, M, White British) frames it by a particular way the ego can be put in its place by DMT:

“Another reason for the giggles was...I said to you I go in usually with a question and it never gives you the answer to that question, it gives you the answer to a question you *should* have been asking. It’s just, a kind of deflation, of what’s left of your ego, just to say – ‘yeah, you really didn’t have a fucking clue, did you!’ Kind of this feeling of ‘ok, alright like, I give up, whatever, cool, great – what else do we have, oh awesome, clouds!’... the greedy thing you go in with – it says, ‘you didn’t need that, SMACK, dickhead, you needed this! So go on and enjoy’... So that laughing at yourself”

An experience of ‘healing’ (5) within and by the DMT state in itself, was demonstrated by BB again, as part of this ego-challenge here, and surprise revelation of love and lack therein (as at the start of this section):

“there’s a particular type...of emotional closeness, of love, basically, which I’m constantly searching for...in particular for my son – fully opening up to that, which I feel like I do. But I just realised, I probably *don’t* completely. But...the intensity of that feeling, that’s the medicine that I need. Just this feeling that there’s like *another* layer, another type of love...

there’s this other thing, always in the background of my mind – ‘Why do I feel I’m not loved enough?’ And there was something, some little lock somewhere inside me, that I haven’t accessed... Just this sense of, you know: take 5% fucked up your whole life, and if it was because of this thing, and all of a sudden – ‘that’s what it is you idiot!’ And it’s really acute and obvious!”

JA (35-39y, M, White British) also required a suspension of ego to facilitate deep spiritual healing, coupled with shamanic-like ritual purgation:

“So if I can connect to whether it’s a sense of fear, or sense of an element of lack of self-love, and then if I can make the right sound, the right frequency, that will help to purge that energy which is sort of stuck within me...

I realise when I’m in that state of consciousness how much I carry on a daily basis [in terms] of difficult energy, blocked emotions I’m not able to pass by or release.

And...it just feels like we're in this pure divine state where we can remember how to process the energies that are difficult to release in everyday life"

This purgative energy is very akin to the intense emotional 'release' or 'relief' (4) experienced by some, such as SH and AF's highly resonant encounters imparting the insight of the *Cosmic game* (see Chapter 3). In AF's case (as with RV) this power was reminiscent of ayahuasca:

"the second part when I laid down...and the crying, it felt like the ayahuasca... I'm just comparing the two things, because it was very liberating, and just like... Yeah, just *be!* I had that sensation of just existing. And I want it to last as long as possible... I just opened myself... Wow, this is powerful what you study [laughing]. My goodness... even the crying was like 'Yeahhh', crying, just 'Ahh, let it go'" (AF: 40-44, F, White Italian)

SH (30-34y, F, White British) shares this impression of simple 'isness' accompanied by such liberation:

"I was like This is The Game, you just go, step into experiences and see where it leads you, without meaning to have an expectation or lesson or story or reason. Just what is just is. Quite profound... Amongst the silliness – it's so liberating. Often when I get these downloads from trips it feels quite heavy like 'Arggh', this just felt like *Pffwahh*. Amazing, like a big release"

While these feelings of profundity, humility and healing can be of serious substance, these are time and again intimately wed with experiences of 'humour' or even 'hilarity' (7). This is well embodied by this above gamification of the cosmos, received by SH as she juxtaposes the profundity and silliness, which catalysed eruptions of laughter – as well as BB's celebratory giggling earlier, being granted the medicine he didn't even know he needed. Not dissimilarly for JB (40-44y, M, White British), the humour hailed from trying to reconcile identifying with greater consciousness:

"also a bit of chatter about ego, and '*not being special*'. Because part of it is, there is a sort of, 'Jesus' sort of feel, an enlightened ego thing. You feel like, 'Wow, I'm so

special!... Then this kind of laughing realisation about what you're saying and thinking, and how absurd it sounds to yourself!"

Understandably, this volume of emotions of such depth and positive valence incited in many subjects a 'gratitude' (8) – from MP or RH (Trip 3) repeatedly uttering "thank you" *in situ* as they tripped, to MP explaining that it was "Just the opportunity, and the healing, and just being alive to witness it". AF responded, in regard to her above freedom from her mind, that she's "bloody grateful" to be able to "enjoy all the things that we forget we are" – but also her humbled appreciation for being gifted the experience, either of the DMT or her own life, asking herself, "Is actually all this time dedicated to me? Like I always had this feeling, it seems all for *me*. This is where the crying comes from [begins crying]"

The thankfulness of OR (Trip 1; 25-29y, M, Brazilian), who belongs to an Afro-Brazilian syncretic ayahuasca-using church, was less for soaring angelic, but for averting a fathoming of hell, explaining that, upon having just witnessed the struggle endured by his non-religious DMT partner:

"in my heart, as I may say this, I was very thankful for having a doctrine or a religion in which I go. Because I was literally hearing like, 'You know what happens when you're not prepared for some stuff'. And the spirit guide was like, 'You're cool! You have this [doctrine], it's OK!'"

Several experiencers expressed their appreciation for their entities, for the teaching and healing they bestow, such as RV who:

"felt them trying to work, even in that short space. As the entoptics faded slightly, I got the impression, the sense of...several entities starting to try to work on the tension in my jaw... they saw that some of the trauma is locked... And I was grateful for that"

An impression of 'familiarity' was oftentimes felt around the beings visited, but frequently a familiarity of a certain scent, a "déjà vu", pervaded the experiential core (11), as gestured at by JB's framing his "different universal plane" as like a return; "to remember" after having "gone back somewhere". Resounding this anamnestic process, RS shares, "I always feel very comfortable there, often I feel like 'Oh yeah this is where I was before, and this is where I'll

go after, I forgot about that!’ sort of – ‘Cool!’ [laughs] Like this lifting of this amnesia”. The conviction can be carved deeply in participants’ minds, as conveyed by AF, “I know I was there, it’s again like all the time, I know this place, its familiar. I’ve been there before, I know, I know, I’ve been there before!” Yet again, this feeling breeding ideas of origins is motioned by AN (25-29y, F, White British):

“It felt like I came from it, I’d come from that submersion, that energy field that I was in, it felt like that was where I come from, so it felt natural to reassemble myself from that space. It felt familiar...doing that reassembling myself, felt natural. Something I’d done before”

As tacit in these accounts (and reverberating with descriptions of the familiar beings, Chapter 3), this unassailable recognition is one which runs beyond partaking in DMT on prior occasions, as clearly substantiated by FF (45-49y, M, White British), referring to an immersion into some natural, yet beguiling mechanism:

“the intensity and the place you are, it’s so phenomenally alien, but familiar as well, but shocking... That second I went in and that sense of fear, like ‘OK I’ve been here before’...

Interviewer: And do you think it’s familiar over and above the fact you’ve been in this place before when you’ve literally done DMT?

Oh yes, oh definitely! No, I remember thinking this the very first time I did DMT, it’s somewhere deep down...that it’s a friend, you know... it’s really interesting how it is such a familiar world”

Neither or Both

Many other parts to the experiences were not patently positive nor expressly challenging, but *Neither or Both*, as described by twenty-one (61%). This predominantly comprised statements as per the ‘intensity’ of the DMT state (21), largely felt to such degrees as becoming ‘overwhelming’. In reference to requesting an intensity rating out of 10 for the whole trip, it was more often than not heard that “it was 10. Yeah, there was nowhere else to go”. Often in the experience’s initial stages, interviewees were adamant “it had gone right off the scale” (RH 2); “It was 11 – it was fucking mind-blowing” (RH 1), “it just seemed

hilarious, because it was so fucking intense that I could only *just* understand the question” (ZD), or in MS’s case, “it was so, so powerful all I wanted to do was make sure I was breathing”, left only to “hang on for dear life!”. This echoes the psychical deluge, the ‘submersion’ discussed at trip onset, where finally, for several, the overwhelm transpired amidst the throes of collapse of their personal world, such as RH’s second experience which “felt like death” and “was so intense...that the ego fractured” – or like during GR’s (25-29y, M, White Romanian) efforts to ground himself:

“It was very overwhelming... And I remember I was just going, my sense of self dissipated, I just did not exist anymore... I opened my eyes at some point, and that was my baseline reality, which was quite comforting in a way, because I was looking for an anchor... there was just so much going on, like what the *hell* is going on!?”

The ability to ‘let go’ or enact a ‘detachment’ (3) despite the initial buffeting received, was manifest in OR’s (Trip 2) adept approach, learnt from his religious practice:

“It’s like a sense, a feeling I shouldn’t just trip, I should understand this is a tool; I can just go with the flow, or I can- it’s a different perspective from the neurotic position, like I *have* to control this – it’s like ‘Eh, I can be in the sea in the waves and let them throw me on the rocks, or I can learn how to surf’! It’s the same space and place, but my perspective on that space is different. I can just be [makes drowning noise], or [makes flying noise]”

Challenging

Experiences which were admittedly more *Challenging* than this occurred, but to a substantially lesser degree, divulged by seven subjects (17%) – and of these, perhaps only three journeys were marked by this on the whole. This may be particularly so for RV (40-44y, M, White British), whose ego’s ‘fear of letting go’ (1), juxtaposed to OR above, has already been touched on in his awe-struck encounter and desire to embrace selfless love, which he here develops in even profounder depth around ‘re-experiencing past trauma’ (1), also emotively catapulting him back to prior ayahuasca work:

“so my ego is not sufficiently developed to let me go into that, sort of to allow the self to disappear, to allow the swallowing of the self into that ‘Super-place’... so it

uses trauma or at least a kind of foundational fear that...I know...exists in childhood-fear as a way of keeping a tendril, preventing the swallowing... so what I see in that space is that this fear I have which stems from this trauma is, well, like a way of keeping me separate...it's a way of preventing that ecstatic self-losing...

letting go and moving through this experience requires this very special, precious loving non-attachment... Which means a certain letting go of your nearest and dearest as well... in the last ayahuasca journey that was a big challenge for me; 'In order to experience this, you have to let go of [your wife and daughter]'. That's what they were telling me- Are you telling me I have to literally leave them!? It wasn't that, it was in order for you to excise this, you have to excise what is essentially a fear, a fear of loss isn't it? It's fucking hard"

Not unlike this experience of RV refusing to accept saying goodbye to his beloved – a stunningly reminiscent type of 'grief' (1), yet one from being forced to leave loved ones behind after having 'died' *oneself*, as well as the resultant 'guilt', was characteristic of LG's (30-34y, M, Mixed British – Sri Lankan-German descent) uniquely chthonic journey:

"I was like, so I'm dead, I *am* dead now. Then I was looking around in this plane... I was...viewing my face, like the shellshock, the magnitude of what's just happened. There was almost like a feeling of, I guess it was grief that set in- grief, but not for me, but for *her* [LG's partner]...

I was like *vrroohmm* into this ethereal aura of whatever icicle thing. Then it was just trying to cope, and acceptance of the fact that this thing, this love is ended, and...she's gonna have to deal with the grief and pain...

I was just there like 'What the fuck is this!?', I couldn't even pay attention to the surroundings that much because I was so distressed by the fact that I was dead [laughter]!"

A further and final category, "Meta-narratives: Co-creative Insight into Heart and Cosmos", acts as addendum to the above analysis, where an unabridged description is provided in the Appendix B, 1. This is owing to the content of answers not deriving directly from questions within the SSI, but were independently volunteered. Mainly, they are not explicitly

pertaining to the experiential content in itself, but rather more interpretative comments upon the experience, and as such not easily comparable with chapter 5's comparison with the near-death experience content. The reader is encouraged to refer to this in Appendix B, 1., given the nature of responses surrounding emotional breakthrough (Davis et al., 2021; Roseman et al., 2019; Timmermann et al., 2020) and ontological belief (e.g. Nayak and Griffiths, 2022; Timmermann et al., 2021; Davis et al., 2020; Watts and Luoma, 2020; Timmermann et al., 2020), relevant to many recent reports.

Discussion

In all, the present thorough thematic and content analysis has illuminated the DMT state as encompassing the *Onset*, though often a difficult labour, to then give birth to a profound DMT breakthrough which presented an all-pervasive spectrum of experiences. These experiences spread across all of the *Bodily* domain, marked mostly by *disembodiment*, the *Sensorial*, being predominantly extravagantly visual, the *Psychological*, transforming the core of the sense of self, and the *Emotional* domain, which was almost universally desirable. This, therefore, is demonstrative of the drug's capacity to take one out of themselves and to engage with another, normally welcome, reconfiguration of all areas of one's own consciousness.

Comparison with other DMT Studies

Representing the one other published thematic analysis on the DMT experience, Cott and Rock (2008) coded 19 reports from an online survey, resulting in nine general themes. These entailed – Distortion in time, space and self; Hallucinations (visual, auditory or bodily); Veridical hallucinations (i.e. considered to be true or real, including sentient beings, see Chapter 3); Affective distortion: involving intense euphoria and anxiety, typically during the “DMT rush” – relating to *Emotions, pleasurable or challenging*, in the above analysis, including at *Onset*; Spirituality: including *beauty or love*, relating to the same themes in the above analysis (also see chapter 5 regarding the near-death experience). Finally, directly linking with themes herein, Familiarity; Lucidity: describing an ability to “fully appreciate the experience as if in an ordinary waking state”; Ineffability: denoting difficulty capturing a

non-linear, nondual experience; Extreme intensity: where participants became “besieged by DMT-induced cognitions”, often leading to anxiety.

Timmermann (2017) delivered a preliminary overview of the prominent effects of 7-20mg of injected DMT among 13 healthy subjects. These encompassed themes pertinent to Michael et al.'s (2021) analysis, namely Complex imagery (e.g. which was familiar, 62% of participants); Sense of presence (e.g. showing intent, 69%); Sense of Receiving information (46%), Sense of Being transported (e.g. to otherworldly space, 69%, reminiscent of the current study's *Space-time shifts*). Themes correspondent to the present analysis included: *Bodily* effects (100% vs., in the present study, 28% *pleasurable*, 22% *neither*, 25% *uncomfortable*) such as an onset including a rush (vibration and warmth), distortion or dissolution (see ‘disembodiment’, 53%, in chapter 5), and pleasure; Simple visual imagery (100%) which were *geometric* (100% vs. 44-17%), *colourful* (77% vs. 36%), *kinetic* (62% vs. 36%), including “vortex...forms”, which may be “cartoonish” or “exquisite...resolution”; and finally Emotions (92%), which were predominantly positive like humility, love, gratitude, or peace – where spiritual feelings and inspiration may correlate to this study's ‘profundity/beauty’, and acceptance and openness, may correlate to ‘loving/connected’. Anxiety/fear (31%) was also coded, corresponding to this report's range from ‘terror’ (at onset, 17%) to ‘anxiety’ (during experience, 8%).

Comparison with other Exceptional Human Experiences

When comparing this study's themes characterising the DMT space with exceptional human experiences (EHEs) of other kinds, as stressed in Chapter 3, abduction or other alien-encounter experiences (Hancock, 2005; Mack, 1994, 2000) may be particularly evocative of the DMT trip. Some subjects' feelings of being ‘trapped’, is similar to the sleep paralysis experience, itself compared to the abduction experience (mainly its first phases; Blackmore and Cox, 2000). The often deeply *Pleasurable* states, under Bodily experiences, are resonant with the sometimes ecstatic episodes reported by abductees, one asserting that she would ‘gladly sacrifice her child’ for that feeling (Mack, 2011) – and the ‘vibratory’ states here are also classically reported by them (Mack, 2000; as well as in OBEs, Montenegro, 2015). The *Visual* experience, under the Sensorial category, of the ‘organic-mechanic’ quality links also to Kripal (2017) and Luna's (2022) attestations that, in the former, the witness leading to the

coinage of 'flying saucer' described the structures as a living beings, and in the latter, the serpentine mother-being of ayahuasca is sometimes experienced in the form of a UFO. The Emotions of a *Positive* nature, such as 'connection, humour and healing', are finally congruent, respectively, with abductees' frequent reports of feelings of oneness, including with the ET beings experienced (Mack, 2000), these entities' trickster-like characters (Keel, 1970), and their spontaneous healings, emotional and *physical* (Strieber & Kripal, 2016), with this latter particularly akin to *RV's* healing (the beings also described by him were 'mantis-like').

Resonances between the shamanic journey and DMT are also obvious, where such DMT-containing 'entheogens' like ayahuasca, or the snuff *yopo*, are employed by shamanistic cultures, for divinatory and healing purposes. The descriptions of this study's participants of 'submergence' at onset are arguably gesturing toward, especially with its watery dimension, the descent into the underworld (Hillman, 1979), but also the evident struggle of the self, and "competing currents", suggestive of the shamanic experience of disintegration (Narby, 2018). Not dissimilarly, the *Emotional/body* related feelings at the beginning of fearing for the integrity of one's life echo this shamanistic rebirth motif, especially in light of propositions that historical near-death experiences acted as the basis for the development of shamanic societies' ritualistic technologies to replicate this experience of dying (Shushan, 2009, 2018). DMT's 'organic-mechanic' aesthetic points to the, particularly entheogen-utilising shamans' entering into (UFO-resembling) shining, metallic structures (Hancock, 2005).

The near-death experience, finally, has evidential overtones of the DMT themes herein. However, the precision of equivalence between the states may have been thus far over-estimated in the literature (see Chapter 3), and this question is the dedicated purpose of a subsequent report (in chapter 5). An abridged version of the similarities (vs. differences) between the analyses herein and the NDE would include sounds at onset, sensations of dying, sentient light-forms, preservation (most NDEs) or a diminishing (minority of NDEs) of the sense of ego, and feelings of peace and love. One example of a lesser discussed NDE feature echoing DMT are the present themes of 'hyperdimensionality' (also reported in Strassman, 2001) and 'clairvoyant-like perception', which are reminiscent of the so-called 'omnidirectionality' of the visual experience of some near-death experiences, such as in the

initial OBE (Ring and Cooper, 2008).

Putative Neural Mechanisms

Closed-eye DMT administration has been found to reverse cortical travelling waves, from backward flowing (carrying top-down predictions) to forward (carrying bottom-up errors/sensory data). This is consistent with a reduction in precision-weighting of ‘priors’ i.e., predictions made about experiential causes and together constituting an internal generative world-model, and which suggests the brain’s action as if it were receiving novel visual input (Alamia et al., 2020). The key other natural endogenous state sharing much with the DMT trip as delineated in the present study, including such complex visionary states, as well as intense, broad emotionality and perturbations in self – especially interactions with others in intrinsic sensorial worlds – is that of dreams. Dreams are the prototype for ‘disconnected consciousness’ in which internal awareness is present despite apparent unresponsiveness – where the major neural correlates of the dream-state appear to be shared with the psychedelic and dissociative DMT state, that is, suppressed alpha cortical oscillations and elevated theta and delta (slow wave; Carhart-Harris, 2007). Both were correlated with intensity of visual imagery under DMT (Timmermann et al., 2019) – with the theta-delta being shown in provisional analyses to be over the temporal association cortices, as in dreams (Timmermann, 2019b). The theta-delta enhancement is also inversely correlated with the (more non-dual) mystical experience (Pallavicini et al., 2020), substantiating its association with the dualistic interactive style of the DMT breakthrough. As such, the DMT condition is akin to a lucid dream, albeit very unique in that the brain-state may be REM sleep-like yet the individual is technically wakeful, and typically experiences the state as real. The TPJ, possessing a key component of the DMN (the iPL), is also pivotally involved in the dream-state (Scarpelli et al., 2019), where the release of the DMN’s inhibitive effects on temporal lobe structures (Carhart-Harris et al., 2014) could also stimulate this region – and elevated global connectivity within the TPJ and insula has been reported at least under LSD (Tagliazucchi et al., 2016).

Relevantly, such DMT & dream theta and delta activity (also increased in other, for instance regressed near-death states), is linked to temporal organisation of episodic i.e. sensorially-rich memories (Buzsáki and Moser, 2013; Martial et al., 2019). However, such episodic

memories are typically autobiographic – which may be re-organised and reimagined in REM sleep, but the personally-recollective nature of the DMT content is not self-evident. Indeed, much DMT phenomenology can be considered to bear little resemblance to that of dreams, suggesting important neural divergences also in their origins.

Many participants in the present analysis articulated experiences in reference to entities, such as the sense of unity and familiarity with them, or love felt for and from them, or healing received. As discussed in Chapter 3, top-down cognitive mechanisms conferred onto basic sensory data may construct social imagery, where computer modelling of this effect has generated examples of anthropomorphic visual forms (Aqil, 2022). Dissociative identity disorder (DID; formerly Multiple Personality Disorder) may also be instructive; a condition in which ‘alters’, secondary personalities, may be considered projected ‘hallucinations’ of the fragmented self (van Heugten-van der Kloet and Lynn, 2020). DID has similarly been compared to the dream-state, with in-dream relationships being a prototype for DID, but which also may be precursive to the disorder suggesting shared neurophysiological mechanisms (Barrett, 1995). Interestingly also, 57% of patients were identified as having their alters presenting as dream characters in their dreams, and 26% as having at least two sub-personalities dreaming at the same time and experiencing each other as characters (Barrett, 1994), which not only gestures at the characters as derivative of the person’s integrated self, but is echoing of the several DMT participants herein who expressed a continuity between themselves and the encountered entities (Chapter 3).

The following attempts to frame specific themes of the present analysis, including some subjective *content*, in terms of their possible neural substrates. For instance, one’s perception of flowing through time has been indicated to be a constructed phenomenon within the generative model (A. Seth, 2021), where participants’ sense of time dilation may derive from elevated prediction error signal and thus updating, as unpredicted stimuli have been shown to appear longer-lasting (Pink-Hashkes et al., 2017). Medium microdoses of LSD also dilate time, even in the absence of subjective effects (Yanakieva et al., 2019).

Descriptions of (open-eye) deconstructions or pixelations of the visual scene, prior to breakthrough elsewhere, is a vivid phenomenological expression of the attenuation of the precision of priors rendering the world-model fluid, before the reversion of backward (top-down) to forward (bottom-up) travelling waves implying visual stimulation (Alamia et al.,

2020), and alpha decrease and theta-delta increase underwriting sensorial memory (Timmermann et al., 2019).

The analgesic effect reported, including ecstasy, links to Timmermann et al.'s (2019) identification that the main phenomenological component of 'bodily' changes during DMT correlated with reductions in the beta oscillatory band, and Timmermann's (2019) fMRI results suggesting that the Posterior Operator Network, implicated in pain regulation, shows disintegration. Two trials are underway to investigate psilocybin's effects on fibromyalgia (Gilligan, 2021; Hendricks, 2021) – and one case study of a psilocybin NDE-like experience also included near complete fibromyalgia remission (Michael, 2022b). One participant reported perceiving themselves where they lay, where such OBE-like imagery is more expectable with ketamine (Luke, 2012). This may be owing to a disinhibition or integration of the TPJ (as above, involved in the world-model construction of dreaming), neuropathology or stimulation of which has been shown to incite OBEs (Blanke et al., 2004, 2015) due to high-level predictive modelling of bodily/vestibular and visual experience becoming disconnected. The one experient, while sitting under a tree, demonstrating the herein-coined 'phythanropy' is reminiscent of altered states generated by *salvia divinorum*, in which the individual may feel themselves as transformed into near-by objects, or indeed plant-life (Luke, 2013). The disintegration of the DMN connector-hub is not only present under the influence of DMT (Timmermann, 2019), but also salvia (Doss et al., 2020).

That the fluxing fractal-geometry was stressed as being sentient in its own right by several, even equated with the experient themselves, that "it is *you*", is discussed in Chapter 3 and harkens back to similar evocations from Strassman (2001). This impression could be undergirded by the reversal of the anti-correlation between the DMN, mediating *internal* self-referential processes, and the Task-Positive Network (TPN), active when engaging *external* attentional demands (Carhart-Harris et al., 2013; Palhano-Fontes et al., 2015). One novel proposition, too, of the reputed 'hyperintelligence' (superior to the experient) of these visual forms, and entities, may be linked to the diminishment of confidence in predictive priors. This may then lead to a loss of experiential context for the raw sensory or intrinsic incoming data, where such a lack of prior standards as reference point may result in the subjective sense of information associated with the imagery as unfamiliar and advanced – which may also help account for the reported noetic 'insights' or 'revelatory' states

(possibly appearing mundane or unintelligible upon return), as well as the sense of ‘humility’ in the context of ego diminishment. While synaesthesia of some description was shared by many subjects (common to tryptamine psychedelics, especially LSD, and typically sound-colour, Luke et al., 2022), one individual, *ST*, depicted an elaborate multisensory-cognitive manifestation. Psychedelic synaesthesia may be prompted by the global hyperconnectivity of non-local networks, which is concomitant with the dis-integration of the DMN which facilitates ego-consciousness. A very apt qualitative expression of both these processes was *ST*’s synaesthetic visualisation of his body/physical internal state and sense of self as a rotating hypercube, and his utterance of being ‘sliced up into a million pieces’. Regarding the binding of the body and very selfhood in this image, the generation of the sense of self is itself likely to be another phenomenon constructed by high-level predictions, but fundamentally of interoceptive inputs from the body and viscera (Solms & Friston, 2018; Damasio, 2021; Seth, 2021). Whereas the TPJ, integrating audio-visual and body schema data, has been a ‘hot-zone’ for consciousness generation (Koch, 2019), *self*-consciousness may not arrive if not for its integration with the insula’s interoceptive information processing (Damasio, 2021).

The very graphic instance in this study of ‘looping’ is a classic example of this well-known part of psychedelic phenomenology. Such loops are a constant reactivation of the same intrinsically generated (autobiographic or imagined) percept, or repeat stimulation of one’s short-term eidetic or echoic memory of environmental stimuli. Bălăeț (2022) discussing the cognitive effects of psychedelics, reviews psychedelic studies on memory. For instance, Williams et al. (2002) points out that 5-HT_{2A} receptors have a key physiological role in working memory (such as in PFC), and that LSD alters neuronal networks implicated in memory (Kaelen et al., 2016). Not elaborated is that (in the context of music listening) this involved increased functional connectivity and information flow between the parahippocampus and the visual cortex, positively correlating with visual, including autobiographic, imagery. Also discussed are impairments in spatial working memory (Wittman et al, 2007), in lexical/numerical working memory, and decreased free recall (Family et al., 2020) under psychedelics.

The preservation of personal ego in several subjects ostensibly throughout their trips is interesting. This is in spite of DMT’s resulting in DMN disintegration (Timmermann, 2019), as

well as other psychedelics' effects of increasing global functional connectivity (Tagliazucchi et al., 2016); reducing parahippocampal-executive network and interhemispheric medial temporal lobe (mTL) connectivity (Alexander V. Lebedev et al., 2015); and reversal of anticorrelation between the salience network and DMN, or DMN and dorsal attention network (Stoliker et al., 2022) – all proposed as undergirding ego-dissolution. However, it appears the temporal dynamics of the DMT experience dictates a continuum with a sense of losing self at the peak (maximal disruption of neural substrates of selfhood), and a greater self-sense prior to and soon after this (concurrent with dualistic interactivity, including entities).

Timmermann et al. (2019) has evidenced a correlation between the intensity of emotionality and neural entropy during the DMT experience, where such diversification of the neural repertoire is considered to index wealth of conscious content. This is consistent with the disintegration of neurally-constraining high-level networks concomitant with spontaneous release of subservient nodes such as the mTL (Carhart-Harris et al., 2014), housing the amygdala and hippocampal zones, limbic regions pivotal to memory and emotional regulation, and freeing of neural, and psychodynamic, energy (Carhart-Harris and Friston, 2010). This is phenomenologically reflective of the intense emotional 'release' reported. The compelling feeling of 'familiarity' also articulated (in ironic opposition to the humour evoked by surprise, maybe linked to undermined priors), likely pertains to neurobiological overlap with 'déjà vu'. Those with temporal lobe epilepsy more prevalently report the sensation, where it is inducible via temporal cortical stimulation – and may also be owing to past dreaming of comparable material (Moulin, 2017). These findings are supported, respectively, by the disinhibition of the hippocampal structures (Carhart-Harris et al., 2014) implicated in memory encoding-consolidation-retrieval mechanisms, and shared temporal slow-wave oscillations between the dream-state, and that of psychedelics and DMT (Timmermann, 2019; Carhart-Harris, 2007).

Finally, of the few severer of challenging experiences, that of intense 'fear of letting go', of accepting the death of one's own self as well as one's personal universe and all that it contains, can be framed again in terms of DMT's disruption of the uncertainty-minimisation by the cortical predictive processing mechanisms. This both means the introduction of disconcerting chaos into the system, but more specifically, the dissolution of the internal

world-model generated by the priors would be, as far as the individual experient is concerned, tantamount to the dissolution of the world itself, and thus subjectively felt as categorically apocalyptic. Additionally, the ‘sense of dying’ (at onset) reported to be associated with terror and breathlessness, including the ‘rush’ effect betraying a sympathetic-activation, may well be in turn associated with the speculated release of endogenous DMT at the moment of human biological death (and evidenced production during rodent cardiac arrest, Dean et al., 2019). Thus, exogenous use of the compound may trigger similar physiological cascades as that which any evolved endogenous release may cause in response to threat to organismal preservation – or similarly, such use leading to the body’s false interpretation of the DMT, including predictive attempts to explain its interoceptive effects, to be a signal of such a threat to life owing to its release as being physically correlated with the dying process (this is bolstered, for e.g., in *EM*’s belief of her dying sensation being due to a feeling of “intoxication” by DMT, Chapter 5)

Therapeutic Potential

The powerful subjective features of the experience, in particular the emotional dimension, may prove important mediators of any clinical effectivity of DMT (e.g. Dos Santos et al., 2018; Watts et al., 2017). Even within the *Onset* to the breakthrough, participants’ experiences of abject ‘terror’, including ‘dying’, may serve as powerful confrontation with one’s mortality – a key tenet of existential therapy – where fear of death itself is suggested to found many psychopathological conditions (Moreton et al., 2020). Continuing from such convictions of dying, ‘expansion’ of the body and transcendence beyond its limiting boundaries, to find oneself in an ostensibly changed dimension, may also alleviate existential distress and thus improve wellbeing (Gandy, 2017). Regarding *Bodily* changes, such as some individuals noting distinct ‘vibratory’ states, this is echoing of so-called ‘shaking therapy’ or tension and trauma release exercises (TRE), inspired by instinctive neurogenic trembling after traumatic events (Beattie and Berceli, 2021) – where at least one subject volunteered a feeling of trauma release during the vibrations.

The account of *MS* found in the *Sensorial* category, in which her skeletal imagery in rapid ‘flux’ signified to her existential impermanence, which if understood would result in humanity’s betterment, points poetically to deep insights which can be garnered from the

aesthetic content of the trip itself. Extrapolating meaning from symbolism and metaphor, such as that within the dream state but equally as legitimately in the psychedelic sphere, has been a cornerstone, especially, of Jungian depth psychology and therapy (Hill, 2019). Though the hypercube was detailed by a number of other participants, the highly baroque 'synaesthetic' episode of *ST* and the cube's inconceivable configurations seemed to emulate his very states of feelings, and simultaneously served a progressive teaching function for him. Again, such unique displays within the experiential content itself may be considered a profound therapeutic technology, in which the experient's inner state, even selfhood, is vividly visualised and from which lessons may be extracted. This is not dissimilar to the gestalt therapeutic approach to dream-states, wherein characters and objects are considered manifestations of fragments of the psyche (Alban and Groman, 1975).

The transient 'memory loss' of one's prior condition and diminutions of sense of self, in the *Psychological* domain, clearly rings of the egoless dimension of the mystical experience, well-documented to predict psychedelic therapeutic outcome (e.g. Roseman et al., 2018; Haijen et al., 2018). The flagrant descriptions by some experients of this cognitively disrupted, yet productive state of mind, such as "coming from nothingness" and suddenly finding themselves in a given experience and flowing with it (e.g. *FF*, *SP*), is strongly suggestive of the meditative state – especially of a mindfulness betraying a radical presence and acceptance of the moment. These are widely accepted to be crucial for mental wellness, their mirroring of central principles of acceptance-commitment therapy (ACT, Hayes & Wilson, 2017) – and its beneficial elevation also being identified after psychedelic experiences (Murphy-Beiner and Soar, 2020; Uthaug et al., 2019). In regard to the alternative, lesser reported, preservation of the ego, one participant, *LG*, articulated an intense death-like scenario, but one in which his retained selfhood lead him to conclude that "death isn't such a big deal". This, akin to the discussion of DMT's existential implications above, points to how this feature, perhaps ironically opposite to the ego-death which prefaces therapeutic relief, also has potential to relieve death angst and thus other related anxieties.

In respect to the *Emotional* effects of DMT, the poignant experiences recounted by most participants, not least *BB*, *RV* and *AF* and others, may be testament to the psychotherapeutic potential of this unique psychedelic state. Indeed, emotional

breakthrough has been substantiated as a distinct component of psychedelic phenomenology (this chapter, see Appendix B, 1.), where its presence has also significantly predicted improved wellbeing, as did the mystical experience which is well-known to do so (Roseman et al., 2019). To begin with the *Positive* reactions, by far the most dominant feeling, the commonly felt ‘loving connectedness’ was manifest in some experients’ relating to the entities themselves, where for *BB* it emanated between himself and his son’s presence, which he effusively framed as a healing experience of his own inadequacies in love. *RV*, too, was movingly heart-opened, expressing an acute reversal of his hitherto “shutting-down” of his deeply-felt aspirations to be a loving person, which he realised to be, in fact, a universal purpose – though also revealed, was the challenge of the inherent need to ‘let go’ with such unification. This type of overwhelming reconnection with oneself and others is yet another pivotal subjective mediator of psychotherapeutic healing from the psychedelic experience (Carhart-Harris et al., 2018; Kettner et al., 2021; Roseman et al., 2021; Watts et al., 2017).

The feelings of immense ‘beauty’ and ‘profundity’ volunteered by very many, encapsulating the aesthetic sublimity and conceptual depth of a seemingly more-than-real alternative world, could be argued to have an ameliorating influence on the crisis of meaning that the contemporary world is presently facing (Cormier, 2018), which in turn addresses the same ‘givens of life’ as those intrinsic to existential therapy (i.e. meaning, death, isolation, freedom, Yalom, 1980). The ‘humility’ when confronted with the enormity of the DMT sphere that several participants disclosed, and its mental health relevance, is congruent with psychedelics’ acute undermining of the ego. For *RV*, again, this crystallised into nothing short of a revelation of the hero’s journey; a mission, though one of selfless service, in which he wished to “bring to humanity” the gnosis he received from the DMT. As such, the therapeutic reach of the experience can be seen not to be limited to the individual, but how their healing aspires to heal others. *BB*’s humbling encounter involved his insight into having asked “the wrong question”, replaced with the “correct” one – a psychological paradigm shift for him. Both experiences link to such a quality of insight in the psychedelic space being instrumental in the positive repercussions (Davis et al., 2021; Erritzoe et al., 2018), with this process being mediated by greater psychological flexibility (Davis et al., 2020) like that during a reconfiguration to a less egoistic perspective.

In the subtheme pointing to DMT's 'healing' properties, *BB* outrightly stated his unbidden revelation of the "cause of his suffering", and *JA* during his ritualistic sound-making shared that he felt a reconnection to the divine replacing his everyday sicknesses. This latter is very evocative of the goals of Transpersonal Psychotherapy (TP) in which the dimensions greater than one's ego are worked with to enact a healing of the person as a whole (Stanislav Grof, 1973). The profuse feelings of 'release' were alternately articulated as the compelling insight to "just *be*" (*AF*) or that "what is just is" (*SH*) – both redolent of the detachment and acceptance, and ayahuasca and 5MeO-DMT's mindfulness enhancements, discussed above in reference to *psychological* effects. These two participants (also *BB*) were, additionally, those whose experiences most characterised the so-called 'Cosmic Game' (an entity communication identified in Chapter 3) – expounded on with the following theme of 'humour'. One technical theory of laughter is its derivation from a surprising or unpredicted stimulus, which is why it may be a classic reaction under psychedelics given their relaxing of 'priors' i.e. beliefs learnt from experience enabling our prediction of our world – which, when relaxed, undermines the rigidity of psychological constructs contributing to psychopathology (Carhart-Harris and Friston, 2019; Carhart-Harris, 2019). Such deep-felt hilarity of the DMT trip is inherent to the idea of the 'Cosmic Game', a theme reflecting a realisation of existence as being a 'divine comedy' and the absurdist nature of the human condition, tantamount to the Hindu concept of *Lila* which denotes the fundamental playful purpose of the cosmos (Watts, 1989). The psychospiritually therapeutic potential of this dimension to DMT or psychedelic phenomenology, in its profound re-envisioning of the universe, may be hard to overestimate – in light of the *pronoia* essential to the experience, diametrically opposed to the paranoid stance to the world.

Several participants expressed their 'gratitude' for the DMT experience itself, and the profundity and healing it brought, self-evidencing the conduciveness of DMT to wellbeing. Such deep gratitude possesses a great capacity to generate a central perspectival shift from one of a sense of deprivation and emptiness to a sense of abundance and fullness. Indigenous societies, typically less psychopathological than contemporary ones, ritually give thanks for their provisions by their natural environment – where the modern world has turned to such techniques as 'gratitude journaling', empirically confirmed to bolster indices of mental health (Jans-Beken et al., 2020). A number of participants also related the

‘familiarity’ of the otherwise alien DMT world, including of the entity characters therein. They couched this as making even the bizarreness or transpersonal events such as egoless unity as a comfortable, or even perfectly natural process (e.g. *AN*, *FF*) – which would have important implications for any naïve and/or patient populations to be administered DMT, if medicalised, given the possible softening of its ontologically or otherwise shocking nature.

This being said, the sheer ‘intensity’ reported near-universally at the onset, entailing deeply-felt threat to life and sometimes overwhelming feeling of instability of there being no experiential reference-point – W. B. Yeats’ resounding line that “the centre cannot hold” – as part of the ego-quashing peak of the trip, could present a real psychological danger to any naïve/patient groups. That this onsetting deluge was framed with watery symbolism is also reminiscent of the Joseph Campbell quote that “The psychotic drowns in the same waters in which the mystic swims with delight”, which may also imply a cautioning of those with any predispositions to psychotic experience. The other *Neutral* theme was the demonstration of ‘letting go’ during the experience, mentioned expressly by a few, but particularly *OR*. His deftness in navigating the sometimes chaotic scene he claims is testament to the value of his religious framework which he brought to the experience, and thus the usefulness in possessing training of some nature in conceptualising and exposing oneself to the space (conversely to *BW*, his partner). This, importantly, is contrary to the present view reflected in psychedelic clinical trials, which are not hesitant to give, potentially ontologically shattering, experiences with traditionally entheogenic substances, which classically give rise to mystical communion otherwise reserved for the mystic; the *mysterium tremendum* being one description to encode the awe simultaneous with the terror it may engender for the uninitiated.

As per the *Challenging* experiences, though they were few and far between (amongst a DMT experienced group), these still had harrowing qualities to them. *RV*, for instance, albeit the only one doing so, spoke painfully about his ‘fear of letting go’ – starkly contrasted to *OR* above – wherein past traumas were reignited which themselves then thwarted an ability of “ecstatic self losing”. He accentuated that even if such self loss were accomplished, it must unthinkably bring with it the dissolution of his personal universe, populated by his beloved family. This being one case, alongside others such as *RH*’s fractured void, *BW*’s psychotiform

confusion, or *ZD*'s existential dread – these instances demonstrate the limit to which the human spirit can be stretched, and though none officially reported any clinically sustained distress, some still shared lingering difficulties which should be recognised by any DMT studies going forward. Finally, the death-like scenario painted by *LG*, interestingly not ego-death, is a reminder of the capacity of DMT to elicit NDE-like episodes (DMT being the main ingredient of ayahuasca, 'vine of the dead'), which are sometimes of negative valence and even lead to trauma-like reactions (Cassol et al., 2019). Mirroring *RV*'s suffering at the prospect of his own annihilation concurring with losing loved ones, *LG*'s experience of nightmarish 'grief' comprised of a refusal, but acknowledged need, to accept his death and thus the 'death' of his relationship with his girlfriend and her own inevitable grief.

As such, the nuanced subjective details of the DMT journey, both positive and challenging, combined with the sufficiency or otherwise of different protocols for the experience, training, vulnerability, preparation and integration of participants, should be well-considered in any plans to make use of this potent molecule with naïve/patient groups in experimental trials.

Limitations

The original report on the DMT field study (Chapter 3) elaborates in depth on the remaining limitations of the study, despite its addressing constraints of past research, and the reader is again invited to refer to this. A summary here would include over-representation of Caucasian males (mostly White British, see Table 1), self-selection bias possibly predetermining quality of the trip, stringent screening including past DMT experiences meaning non-naïveté and exposure to psychedelic culture thus influencing experiential content (Hartogsohn, 2016), untested plant-extracted physical substance used, and an uncontrolled naturalistic versus lab. environment. All such shortcomings being so, certain justifications can be made where, respectively, this demographic constitutes typical DMT users (Palamar and Le, 2018), ethical reasons contributed to using experienced users, experiences after use of the untested DMT is patently congruent with past research (see *Comparison with other DMT studies*), and lab. contexts problematically introducing primes (Luke, 2017).

Chapter V:

An Encounter with Death: A Content Analysis of the DMT Experience from a Naturalistic Study and Comparison with the Near-death Experience

“...like being fired out the muzzle of an atomic canon with neon byzantine barrelling”

– Alan Watts, on describing his first DMT experience, quoted in Leary (1966)

Introduction

DMT phenomenology relevant to NDEs

Sai-Halasz et al. (1958) in the very first human I.M. DMT study, write at the outset that, “several subjects report at first an experience similar to the end of the world, with strong fear of death”. Most interestingly, the term “near-death experience” appears within their schematisation of participant experience-types (see Figure 2, below), almost 20 years prior to Moody’s ‘coining’ the term. Saliently, Sai-Halasz et al.’s category has the lowest incidence (6/30), though still representing a not insignificant 20%. Particularly pertinent in this first DMT study is the following excerpt of one participant, Dr. E. C. H., with evident NDE-relevant themes of noise at onset, feelings of death, travel elsewhere, benign, god-like beings of light, emerging from darkness to light, reluctance to return, and more generally mystically-relevant motifs of oceanic boundlessness and noetic insight – which thus also undermines the DMT-NDE link as meme-generated after its later popularisation:

“I hear whistling. I am *en route* somewhere, but where?... This is death... I have arrived. In front of me are two quiet, sunlit Gods. They gaze at me and nod in a friendly manner. I think they are welcoming me into this new world. There is a deep silence as in the desert... This is Egypt, what wonder, these are the sons of the Sun, and I am finally at home...in that real and beautiful world, where serene people move between the tall yellow columns and statues behind the two Gods. How dignified and simple they are. Their sunburned faces are radiant, and their movements are free and graceful... From the darkness I see through the black iron

lattice into the bright temple. Green smoke floats about in it, and a gong sounds. China!... I am a very small dot, like a flower on the water rocked by the waves. The whole world is frightfully realistic. This is the true color and shape of things. Dangerous game; it would be so easy not to return... I have become a different person...more free. I now understand much more”
 Sai-Halasz et al. (1958, p. 7)

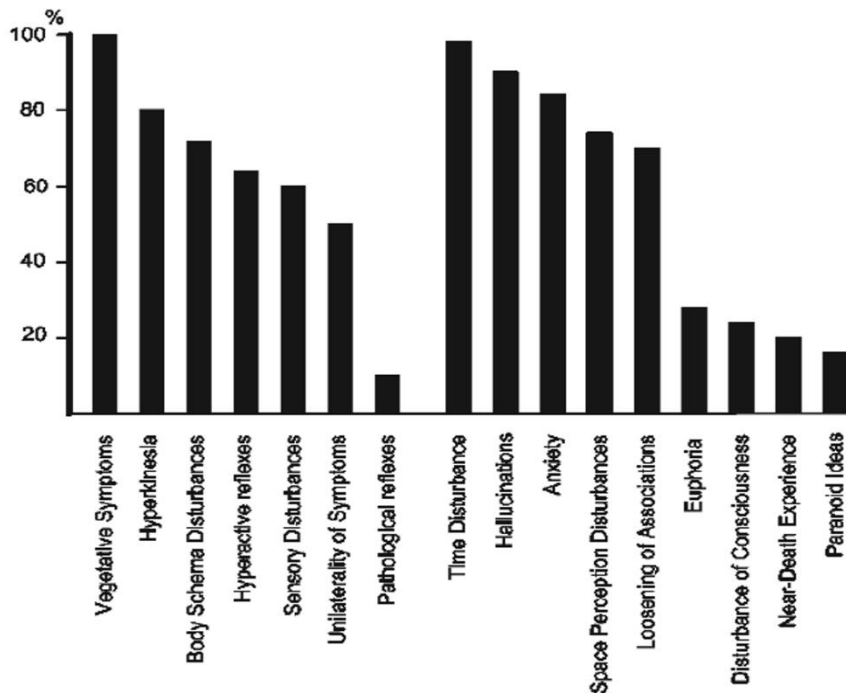


Figure 2: Sai-Halasz, Brunecker & Szara (1958)’s first human DMT study illustrating ‘near-death experiences’ occurring in 6/30 participants

Based on online DMT reports, Meyer's (1992) mapping of the DMT space culminates in the ‘white light’, and based on ayahuasca phenomenology, Shanon (2002) concludes his 14 stages with “the primordial point of light...from which all has been created...all of creation, of life, of intelligence... this point of light has been called God”. Shanon’s inventory of ayahuasca entities also encompasses humanoid, winged beings composed of light, religious deities, demons and beings of death. In Cott and Rock’s (2008) retrospective thematic analysis of DMT from 19 respondents, no excerpt, however, is provided in which experiences or fear of death or dying transpired. Despite this, they note that the entities themselves often fulfilled the ‘positive performative function’ of imparting information

about themselves and the universe, which is redolent of roles enacted by NDE beings, usually deceased persons (Kelly, 2001; Lange et al., 2004). Their theme of “Spirituality” is stated as being consistent with NDE phenomenology given religious dimensions and its transformative nature (Greyson, 2006; Lange et al., 2004) – though, the similarities mainly lie in their both being highly mystical (e.g. ego and time-space transcendence, unitive experience) versus being specifically NDE-like in structure (Athappilly et al., 2006).

Additionally, Davis et al.'s (2020) survey of DMT-occasioned entity encounters included at least 7% involving communications from the beings that the ‘DMT state is the post-death state’ and that ‘death is only the beginning’. Sixty-nine per cent of respondents endorsed receiving a message or task, where ‘valediction’ was qualified as “being told farewell, or one is not ready for the experience”, mirroring communications given, usually by deceased loved ones, as NDEs are sent back. Nineteen per cent reported a ‘prediction’ about the future, where in NDEs the ‘life preview’, a form of prophetic vision, is sometimes presented which may be of the individual’s life, the trajectory of the species or of the planet (such as climatological devastation, Ring, 1992). Also noteworthy is that the *least* common DMT entity-types were deceased family (2%), deceased unknown (2%) and deceased friend (1%), Additionally, religious figures/angels and elves were amongst the uncommonest (<16%), which is of interest given these being directly spiritual and/or folkloric typologies, where these ‘little people’ are traditionally believed to *be* spirits of the dead (Evans-Wentz, 1911) – and therefore DMT being distinguishable from NDEs in that angelic/religious entities or the dead are the quintessential entities met in the latter (Cassol et al., 2018; Charland-Verville et al., 2014). Davis et al.’s *most* common, yet generic descriptors of guide/helper or spirit (34-43%) are still compatible with those of NDEs (except “alien”, 39%, emphasising DMT’s modelling of abduction phenomena).

Simulation of the NDE by DMT

A group of studies have dedicatedly looked at the experiential relationship between DMT and the NDE, constituting a consideration of the capacity of the psychedelic to model the phenomenon. The most originally significant is that of Strassman (2001), wherein the resultant experiences of other worlds and other beings led to a formal hypothesis of (pineal) DMT indeed physiologically contributing to the near-death experience. This was despite only

one of over 60 participants having significantly NDE-reminiscent experiences, and who reported an intention to have such an experience (Strassman, *personal communication*, 22nd April 2022).

The below described studies have been elaborated on throughout the literature review, but are here summarised again given their centrality in couching the present study, which is itself pivotal for the wider thesis. Potts (2012) compared the NDE scale to a self-made short-list of themes from Strassman's studies, concluding there to be insufficient comparability to support the DMT hypothesis of NDEs. Liester (2013) similarly compared Moody's core features and certain celebrity near-death experiencers (NDErs) to Shanon's (2002) documentation of ayahuasca, accepting similarity and possible shared mechanisms, yet simply noting the presence of autoscopy in NDEs and geometric patterns in DMT.

As such, the literature on direct evaluation of the deviation and resonances between these two phenomena has thus far been superficial. However, more rigorously quantitative approaches include Charland-Verville et al. (2014) who compared scores on all NDE scale items between classic NDEs and (retrospective) NDE-like experiences, for instance from temporal lobe epilepsy and sleep states as well as drug intoxication, finding insignificant differences, concluding canonical NDEs and those in non-life-threatening conditions to be phenomenologically indistinguishable. Paralleling this, and most saliently, Timmermann et al. (2018) prospectively compared NDE scale results between participants in a laboratory DMT study and NDE experiencers authentically near-death, again concluding all DMT subjects to qualify for having an NDE and being equally as likely to report each feature.

Similarly, Corazza (2008) also, retrospectively, compared the NDE scale between ketamine and near-death experiences, mostly identifying equivalence, except for bright light and (continuous with our findings below) meeting the deceased/deities and a border of no return. The main issue with this study entailed single NDEs being compared to, possibly, thousands of reported ketamine trips (Luke, 2009). All the aforementioned studies are based on the gross structure (phenomenology), which while confirming that DMT reliably reproduces the NDE on at least this level, does not address its capacity to more subtly simulate the NDE's nuanced content (specific quality).

Other studies experientially assessing drug states and the NDE includes Martial et al.'s (2019) identification of ketamine, *Salvia divinorum*, followed by other serotonergic – including DMT – and other monoaminergic or dissociative psychedelic online trip reports to most significantly mirror the NDE. However, again, this was especially limited by relying only on type and frequency of word use employing natural language algorithms.

Crucially, this endeavour to confirm or disconfirm the overlap of the experiential repertoire between DMT and NDEs has a wider precedent in the general consideration of the question of 'if drugs have religious import' (Braden, 1969; Smith, 1964). This has more recently and rigorously been explored via Griffiths et al.'s (2019) survey of encounters with 'God' or 'Ultimate reality' as compared between naturally-occurring and serotonergic psychedelic-induced experiences. The authors concluded phenomenological near-indistinguishability, and mainly terminological differences, between the two forms, favouring justification for the legitimacy of drug-occasioned mystical experiences. Such contemporary comparative analyses of natural versus pharmacological mystical-type experiences and implications for 'genuineness', however, are in stark contrast to the extraordinarily rich cultural history of the use of such 'entheogens' predicating entire religious cosmologies by shamanic societies.

Contribution to the NDE by DMT

Similarly to the above, the literature review provides an in depth compilation of studies which contribute to the corpus of understanding on neurochemical mediation of the NDE, especially regarding endogenous DMT – but the following acts as a crucial precis, given the criticality of this literature for the present study.

Not only does DMT model the NDE to at least a certain extent, but there is some indirect supportive evidence that it may physiologically contribute in near-death states. Firstly, the enzyme necessary for its synthesis from tryptamine, INMT, was identified in the human brain (Saavedra et al., 1973; Saavedra and Axelrod, 1972), and it is present in human urine, blood and CSF (Barker et al., 2012). While Dean et al. (2019) recently confirmed human brain INMT, they also demonstrate high co-localisation of AADC, the initial requisite enzyme converting tryptophan to tryptamine, and INMT in the rodent cortex, compared to lower in peripheral tissues. Dean *et al.* crucially also evidence DMT itself to be present in cortical

tissue, though again only in rodents, and at levels comparable to canonical neurotransmitters. Extremely significantly, DMT was shown to increase in levels an average of 6-fold during induction of rodent cardiac arrest, and while it has also been identified in rat pineal gland (Barker et al., 2013), here such increase occurred even after pineal resection although to a lesser extent.

That DMT may be released during severe hypoxic states like near-death to mitigate neuronal death may be supported by a recently burgeoning body of work exhibiting psychedelics as ‘psychoplastogens’, that is able to confer neurogenic, neuritogenic and synaptogenic changes in the nervous system rendering it a potential treatment for neurodegenerative disorders or brain injury (Khan et al., 2021; Kozłowska et al., 2022; Saeger & Olson, 2022; Vann Jones & O’Kelly, 2020). DMT itself has been shown to be neurogenic *in vivo* (Morales-Garcia et al., 2020) and ayahuasca was found to increase BDNF in humans (de Almeida et al., 2019). Potent neuroprotective and anti-inflammatory properties have also been evidenced (Szabo et al., 2014, 2016; Szabo & Frecka, 2016).

Rationale for current study

The primary rationale for the present study can be considered in terms of a certain triangulation of modes of approaches or levels of analysis to the question of the psychopharmacology of the near-death experience – neurobiological, psychometric and qualitative. While the direct-most approach would be to search for endogenous DMT changes in the human in near-death conditions, this has both practical and ethical challenges, yet neurobiologically, brain DMT has indeed been shown to be increased near death in rodent models (Dean et al., 2019). The use of questionnaires and other quantitative methods has illuminated the basic phenomenological structure and general semantic quality of the NDE to be simulated by DMT (Timmermann et al., 2018) and other drugs (Martial et al., 2019; Charland-Verville et al., 2014), including indications of frequency of features. However, the more nuanced nature of how each of these features manifest between the two forms of experience, i.e. the qualitative content of the experiences, is only clarified if detailed qualitative content analyses are performed. A core difference between a resolution only at the level of qualitative content versus phenomenological structure is that the former is sensitive to individual and group subjective differences, whereas the latter has origins

which may be more objectively-predicated (Petitmengin, 2006; Varela, & Shear, 1999). This dichotomy can be analogised to the *texture* (content) or the *template* (structure), respectively, and it may be only in this former dimension that departures between the two experiences may be resolved. Once crystalised, the picture would be clearer as to the implications of the level and type of experiential overlap for the source of the near-death experience, including DMT's potential role. As such, the current report aims to achieve such an analysis of the DMT experience, focusing on themes pertaining to the near-death experience, death and re-birth, which is paralleled with a systematic comparison with narratives of classic near-death experiences derived from raw data upon which a recent thematic analysis of the NDE was based (Cassol et al., 2018).

Finally, there are also significant theoretical foundations for considering the possibility of endogenous psychedelic agents (or 'endo-psychedelics), like DMT, to be physiologically elevated in near-death states. Recently, Gosseries and Martial (2020) and Scott and Carhart-Harris (2019) have suggested the administration of psychedelic compounds to patients with disorders of consciousness (DoC, ranging from deep comatose to vegetative to minimally conscious states). This is owing to entropy and other complexity measures of consciousness being known to be reduced in such states (e.g. Casali et al., 2013), and recent evidence of psychedelic substances to elevate such entropy/complexity (e.g. Carhart-Harris, 2018; Schartner et al., 2017). In short, a naturally-evolved endogenous version of this may be transpiring during NDEs, accounting for the apparently paradoxical awareness reported by NDErs during ostensibly unconscious states. If such DoC patients do not become behaviourally responsive (such as waking up) upon psychedelic treatment, they may still report experience if they recover later, which is analogous to retrospective reports of NDEs from those surviving near-death conditions – and if only a fraction of DoC patients report such experiences, this may be a similar proportion to survivors with NDEs, and the content may be comparable to NDEs themselves. Alternatively, if they do not behaviourally respond, brain complexity measures (such as Lempel-Ziv Complexity; LZC) may still be increased and theoretically, though without reporting as such (unless with later waking), they may still be having internal experience – but one of disconnected consciousness (where complexity may support enriched consciousness, but brain networks are still sufficiently damaged to prevent engagement with external world; Martial et al., 2020). Given psychedelics increase of

entropy/complexity, e.g. as measured by Perturbational Complexity Index (PCI), and their subjective enhancement of conscious *content*, that is, richness of experience, over arousal/wakefulness, that is, level of consciousness *per se* (Scott & Carhart-Harris, 2019), it may result that only such disconnected states of consciousness, akin to the REM state, occurs. This said, increased range of conscious content may also correspond to increased *level* of consciousness (Bayne et al., 2016; Boly et al., 2013; Carhart-Harris, 2018; Overgaard & Overgaard, 2010; Seth et al., 2008). Tellingly, tests of psychedelics' increase of LZC/PCI and the behavioural response in sedated animals, sedated humans and asleep humans demonstrating a possible promotion of REM (Apter, 1958; Muzio et al., 1966; Torda, 1968) – as well as 5-HT_{2A} antagonists (having the opposite pharmacology and effects to classical psychedelics) showing increases in slow-wave non-REM comparable to the Unresponsive Wakefulness Syndrome brain activity (Carhart-Harris & Nutt, 2017; Rosanova et al., 2018) – acts as substantive support for the idea that if endo-psychedelics may be released near-death, they may indeed be largely responsible for engendering NDE, including those during anaesthesia.

Methods

The following outline of methods serves as a summary of the recruitment, materials, procedure and analyses which were elaborated upon in full in the methods section relevant to this chapter under Methods & Methodology (Chapter 2).

Participants from the DMT Field Study were recruited primarily through social media and were required to meet strict criteria, including having used DMT at least three times previously, possessing their own DMT supply, and residing within the specified UK regions. Exclusion criteria included previous psychedelic experiences with lasting negative impact, a history of serious mental health disorders, including substance abuse. Out of 64 prospective participants screened, 39 were included, leading to 47 DMT sessions. After removing interviews that didn't meet specific criteria, 36 sessions were analysed (See figure 1 for recruitment, and table 1 for participant characteristics).

This chapter entails a comparison between the results from the DMT analyses from the present Chapter as well as Chapter 3 & 4, and written near-death experience (NDE)

narratives shared by the university of Liege. Demographic information of the 34 patients providing the narratives includes, consisting of 23 males and 11 females, an average age at NDE being 48.2 years and the average time from NDE to narrative submission being 10.2 years. All of the patients experienced a coma due to anoxic conditions. The narratives, originally in French, were translated into English through a four-step process to ensure accuracy.

The DMT research was conducted with strict anonymity due to DMT's legal status as a class-A controlled substance. Eligible participants were provided with a pseudonym, and their personal information was never recorded or shared.

The dosage of DMT administered was carefully measured, with the minimum dose being 40mg, and the participants used their own smoking devices to inhale it. A semi-structured interview was used to explore the participants' experiences, with the conversation domains reflecting some of the major categories of the Hallucinogen Rating Scale (HRS).

Participants were asked to rate the intensity of their experiences at 1-minute intervals. Post-experience interviews were conducted as soon as the effects of the drug began to subside and lasted at least 30 minutes.

The DMT transcripts were subjected to thematic analysis, following guidelines provided by Braun & Clarke (2006), using a purely inductive approach – with eventual themes surrounding experiences of death, near-death, and mystical experiences in relation to DMT use.

The results were then compared and contrasted with a previously published analysis of the NDE (Cassol et al., 2018). To ensure a comprehensive and correspondent comparison, new items were added to the existing NDE analysis, after the NDE narrative were also subjected to a basic thematic analysis. Direct excerpts from both the DMT study and the NDE narratives are quoted throughout the results to facilitate a nuanced comparison of content.

In addition, the near-death experience scale (Greyson, 1983) was administered to participants of the DMT study as a quantitative measure. These results were compared with a previous study, which itself compared scores on the NDE scale from a prior laboratory DMT study with actual near-death experiences (Timmermann et al., 2018).

Results

Table 4 below compares the themes/subthemes present in the DMT experience analysis (both across the current, and separate reports of chapters 3 & 4) to those present in the current extension of the analysis of the near-death experience narratives. They are presented in order of highest frequency of themes under the NDE thematic analysis (except for 'Entry' and 'Return' i.e. beginning and ending). The green highlight under the NDE column refers to the theme being added to the original after reanalysis, while the green highlight under the DMT column refers to their being added to original analysis in order to match the NDE theme. Italics denotes the theme as not being subsumed under "Near-Death Experience, Death & Birth" category of the present DMT analysis, yet corresponding to themes in the NDE analysis (Cassol et al, 2018) – thus, these represent further themes directly relevant to the near-death syndrome, yet coded in previous reports (either Chapter 3; Chapter 4). "N/a" means uncoded or un-counted (not implying lack of presence), "0" (under frequency) means not present in either DMT or NDE analysis, and "+" means this percentage may only explicitly have reported the theme, but it may be higher (to be more consistent with NDE). Uncoded, and thus excluded, yet not necessarily absent themes include 'emotional' and 'bodily' experiences of NDE, due to not being coded in Cassol et al in the same way as other themes, as well as entity 'roles' and 'demeanours' of NDE, due to their being uncoded in Cassol et al.

Content & prevalence comparison

Table 4: Content and prevalence analysis of themes from both DMT Thematic Analysis (including present analysis; Chapter 3; Chapter 4) and original NDE Thematic Analysis (Cassol et al, 2018) & Reanalysis.

DMT Thematic Analysis (including present analysis; Chapter 3; Chapter 4)		NDE Thematic Analysis (Cassol et al, 2018) & Reanalysis	
<u>Equivalent themes/subthemes</u>	<u>Frequency</u> <u>/ 36 (%)</u>	<u>Themes & Subthemes</u>	<u>Frequency</u> <u>/ 34 (%)</u>
<i>Onset</i>	<i>36 (100)</i>	Entrance	6 (18)
	0	Soft	3 (9)
	0	Dark night	2 (6)
Bright Light(s)	9 (25)	Light	25 (74)
	n/a	Attractive	10 (29)

	n/a	Enveloping	2 (6)
	n/a	Intense	16 (47)
	n/a	White	15 (44)
	n/a	Soft	3 (9)
	n/a	Not dazzling	3 (9)
	n/a	Yellow	1 (3)
	n/a	Diffuse/unknown source	8 (24)
	n/a	Alive	1 (3)
	0	Tunnel (Corridor = 1) – Leading to Light	9 (27)
	0	Dark tunnel leading to Light	3 (9)
Tunnel-like structures (Onset)	7 (19)	Tunnels at onset	9 (27)
Tunnel-like structures (During)	10 (28)		0
		Time Alteration	16 (47)
<i>Time-space transcendence</i>	8 (22)	Total time loss	8 (24)
<i>Time dilation (During)</i>	5 (14)	Time dilation	6 (18)
<i>Time dilation (Onset)</i>	6 (17)		
	0	'Integrated' time	1 (3)
<i>Encountering Other Beings</i>	34 (94)	Entity encounter	15 (44)
<i>Presences (No imagery)</i>	6 (17)	Sensed presence	2 (6)
<i>Omnipresence</i>	5 (14)		
<i>Omnipresence</i>	5 (14)	Universal Intelligence	2 (6)
<i>Hyper-intelligent</i>	7 (19)	"God"	1 (3)
	0	"Holy Spirit"	1 (3)
<i>'Otherly' creatures</i>	26 (72)	'Imaginary' entities	9 (27)
	0	Ferrymen	1 (3)
<i>Silhouettes/Featureless</i>	8 (22)	Silhouettes / Faceless	3 (9)
<i>Hooded figures</i>	1 (3)		
Light Being-esque	3 (8)	Beings of Light-like (e.g. Preternatural light, sentient, benevolent, hyperintelligent, powerful)	5 (15)
<i>Fearsome</i>	3 (8)	Headless/torturing	1 (3)
<i>Succubus/Unevolved souls</i>	1 (3)		
<i>Hideous</i>	1 (3)		
<i>Serpentine entities</i>	3 (8)	Lost/tortured souls Snake-like	3 (9) 1 (3)
<i>Trickster</i>	3 (8)	Trickster	1 (3)
<i>Mischievous or Jestful</i>	5 (14)		
<i>Face(s) + Hands only</i>	2 (6)	Just face & hand	1 (3)
<i>Doctor / Scientist</i>	1 (3)	Doctors	3 (9)
<i>'Psychic surgery'</i>	1 (3)	'Psychic surgery'	1 (3)
<i>Human</i>	6 (17)	Humans/Human-like	15 (44)
<i>Relatives</i>	2 (6)	Relatives	10 (29)
	0	Friends	1 (3)

	0	Unknown family	1 (3)
<i>Unknown people</i>	4 (11)	Unknown people	4 (12)
Deceased relatives	2 (6)	Deceased	9 (27)
		Relatives/friends	8 (24)
		Unknown dead	1 (3)
	0	Alive	3 (9)
<i>Communication</i>	14 (39)	Communication	7 (21)
	0	Returning to life	7 (21)
	0	Sense/Message of Mission	4 (12)
<i>Intuition or Telepathy</i>	13 (36)	Telepathy	4 (12)
	0	Verbal	n/a
	n/a	Dialogue	3 (9)
	n/a	Unilateral	4 (12)
<i>Lucidity / Ego preservation</i>	5 (14)	Hyper-lucidity	14 (42)
<i>Vs. Ego death</i>	11 (32)	Ego death	1 (3)
<i>Clear mind</i>	1 (3)	Clear & quick wit	2 (6)
<i>Intuition</i>	1 (3)		
<i>Unitive</i>	9 (25)	Universal unity	3 (9)
<i>Noetic</i>	8 (22)	Omniscience	5 (15)
<i>Exploring Other Worlds</i>	36 (100)	Scene Description	14 (42)
<i>Natural landscapes (e.g. river)</i>	4 (11)	Natural scene	4 (12)
<i>E.g. "Babylonian... Hyperdimensional garden"</i>			
<i>Plants & Flowers</i>	10 (28)		
<i>Infinite/Vast</i>	n/a	Infinite	5 (15)
	0	Waiting queue	1 (3)
	0	Office	1 (3)
		Landscape	1 (3)
		River	3 (9)
	0	With lost souls	2 (6)
	0	City	1 (3)
<i>"Spirit world"</i>	1 (3)	"Heaven"	2 (6)
	0	"Hell" / Hellish realm	2 (6)
<i>Laboratory</i>	1 (3)	Operating clinic	1 (3)
	0	Cord of light	1 (3)
<i>Molecular or Subatomic</i>	3 (8)	Atoms in walls	1 (3)
		Darkness – Empty & Inescapable	13 (38)
The Void / 'Limbo'	4 (11)	Waiting room (no walls)	1 (3)
Dark space / void-like	2 (6)		
	0	Movement through (the darkness)	2 (6)
Sound (Onset)	3 (8)	Sound (associated with Movement)	1 (3)
	0	Music	2 (6)
	0	"Shining black" (Dark-light	1 (3)

		simultaneity)	
Disembodiment	19 (53) +	OBE – Perception of body	12 (35)
	0	Witnessing emergency situation [potential veridicality]	9 (27)
		Possibly corroborated	3 (9)
	0	Elevated perspective	6 (18)
	0	Sensed detachment	3 (9)
	0	Communicating in vain	2 (6)
Repulsed by body	1 (3)	Rejection of body	1 (3)
Etheric body	2 (6)	Etheric body	3 (9)
	0	Re-incorporation into body	2 (6)
		Incorporation into another's body (attempt)	3 (9)
Sense of dying (Onset)	6 (17)	Awareness of death	9 (27)
Sense of dying (During)	8 (22)		
<i>Metaphysical beliefs (inc. hyper-reality)</i>	18 (53)	Real / Hyper-real	9 (27)
Life Review	2 (6)	Life Events	8 (24)
Reviewing	2 (6)	Reviewing	5 (15)
	0	Reliving	2 (6)
Past	2 (6)	Past	6 (18)
	0	Future	1 (3)
Imposed	2 (6)	Imposed	2 (6)
	0	Selected/Free scrolling	1 (3)
	0	Judgement	
		Self-judgement	2 (6)
		By 'Council' / other beings	2 (6)
	0	Life as 'model'	1 (3)
		cinema	1 (3)
		'Over-brain'	1 (3)
<i>Difficulty expressing / Recourse to metaphor</i>	19 (53)	Ineffability	4 (12)
	0	Threshold/Border	3 (9)
		Doors	2 (6)
		Black screen	1 (3)
<i>Loving or Connected Benevolent / Loving entities</i>	10 (28) 10 (28)	Love	3 (9)
<i>Co-creation / Lucid dream-like</i>	10 (28)	Co-creation / Lucid dream-like	3 (9)
<i>Deus Ex Machina</i>	3 (9)	'Deus Ex Machina' (From primordial/void-like to heavenly space)	2 (6)

<i>Geometry or Patterns (Onset)</i>	6 (17)	Colourfulness	1 (3)
<i>Geometry (During)</i>	16 (44)	Patterned	
<i>Flux</i>	13 (36)	Fluctuating	2 (6)
	0	Return	19 (56)
		Dark night	1 (3)
		Told to go/sent back	5 (15)
		Made decision	2 (6)
		Given choice	1 (3)
		Ejected	4 (12)
		Guided to body	2 (6)
		Brutal	3 (9)
		Sleep	2 (6)
		Confusion	2 (6)
		Disappointment to return to illness / life	12 (35)

A comparison of the themes, and especially their frequency, between the DMT and NDE states which the above table provides is especially useful, as it facilitates a different type of quantitative analysis which helps identify features not included on the near-death experience scale (NDES; Greyson, 1983). This scale was administered to participants of the present DMT field study, which was compared with its administration in a prior laboratory DMT study and to actual near-death experiences (Timmermann et al., 2018) – See Appendix C, 2. for full results and discussion of this analysis. The comparison of themes/frequency between the states also helps identify if there is agreement with the comparative prevalence as shown by the NDES scores of the NDE and DMT experience (where only the DMT field study will be specifically compared with). The difference in the precise nature of the content of each theme is often reflected in the names themselves, but this will be a special discussion throughout the *Thematic analysis of the DMT experience: “Near-death Experience, Death & Birth”* below.

Regarding the feature of some special form of ‘light’, while the same on the NDE scale (see Appendix C, 2.), this theme was three times more common in NDEs versus the DMT reports – where the predominant gravitation toward a white light was entirely absent from DMT. This being so, the idea of an envelopment by a diffuse, non-dazzling (internally derived), brightness is comparable to the DMT content (though colourful/geometric in the latter;

again, *content* differences are discussed in *Thematic analysis of the DMT experience* below). Relevant to this is the ‘tunnel’ phenomenon, where despite its absence as an NDE scale item, the NDE narratives showed (often dark) tunnels in 27% of cases, all of which had a light at the end and all were near the beginning of the experience. This contrasts to the DMT reports, where 19% expressed ‘tunnel-like structures’ at the beginning, and 28% which continued throughout. While the prevalence is very similar, resemblance in content to stereotypical ‘tunnels’ and their timing represents stark differences to the NDE.

Considering the ‘encounter phenomenon’, the NDE scale scores indicated ‘mystical being’ to be substantially higher in the DMT field study results than the NDE – where, comparably, only 44% near-death narratives showed some encounter, versus 100% of the DMT participants. This discrepancy is echoed in the NDE’s theme of ‘imaginary’ beings, illustrated by 27%, where the equivalent ‘otherly creatures’ of the DMT reports was evidenced by a much higher 72%. The concept of a ‘Being of light’ (benevolent, hyperintelligent etc), specifically, was however of comparable frequency (8% DMT, 15% NDE) – yet whose content mostly differed. Hostile entities (fearsome, demonic-like e.g.), on the other hand, were again similar in their very low prevalence (3-8% of DMT reports including different subtypes of this category, 3-9% of NDE reports including different subtypes of this category) – where both may share an underestimation of such prevalence, reflecting the DMT subjects’ experienced nature and home settings, and distressing NDEs being likely under-reported but at least approximated at 14% (Cassol et al, 2019). The ‘trickster’ character, with ambivalent and deceptive qualities, was decidedly higher in DMT reports (8-14%) versus the NDE (3%) – however, the precise content of the one trickster entity in the latter was remarkably like that observable in DMT (discussed in *NDE-like Cases*, below). Briefly, one DMT participant (*DD*) reported a face of a god-like yet child-like being luring him into another realm, and who was at once mischievously toying with him and ‘maternal or nurturing’. Akin to this, was the one NDE case also portraying a shining black face (already suggesting such ambivalence) compelling the NDEr to join the being in a realm of eternal suffering, yet benevolently performed ‘psychic surgery’ (in which some operation is performed for psychotherapeutic effect – reported also by another DMT subject, *RV*, as mantis-like beings ‘worked on his jaw’ to release the trauma locked therein), and the experient terming them the ‘Holy Spirit’. Thus, these 2 depictions being extraordinarily

mirroring in content. The lack of ‘ferryman’ in the DMT reports is salient, too, where the concept of such psychopomps may not be functional in a context not really near-death.

The NDE scale item of meetings with the deceased was one of the lowest scored across DMT participants, and being substantially higher for NDErs. The thematic analyses show the vast majority of the NDE encounters to be with human/human-like figures, most of whom family/friends, and in turn most being deceased (27%) – likened to the DMT interviews, where though the great majority of encounters are humans and only a couple are known, those who are known are also deceased (6%). The fact of only a small fraction (though absent in DMT) of known living persons occurring in NDEs, may suggest that the argument of the ‘peak in Darien’ phenomenon being owing to statistical chance is unlikely. The dead’s communication is always surrounding ‘returning’ to life (21%), exhibiting their function as ‘sending back’ the experient – which is totally absent from the DMT reports.

The item of ‘ego dissolution’ is also not included in the NDES, which mirrors its occurrence in only one NDE narrative – compared to (a possibly underestimated) 32% in the DMT trips. ‘Unity’, closely entangled with this, is an NDES item, which shows marginal differences between the states – however, this theme of universal unitivity is almost triple in DMT (25%) versus the NDE (9%). On the NDE scale, there is no difference on the ‘separation from body’ item. Despite this, ‘OBE’s occurred in 35% of NDE cases, most of whom assert being witness to their critical condition, with half hovering over the scene (at least 9% claiming a *corroborated* perception). This is different to the DMT state, in which (again likely underestimated) 53% reported ‘disembodiment’ specifically of a total dissolution of body awareness, without any such detachment and autoscopic phenomena. Thus, marked content discrepancies despite similar prevalence. Likewise, attempts at re-incorporation into a different body than their own was certainly unique to the NDE.

Peculiarly, the acknowledgement of being near-death is not an NDE scale item, and an ‘awareness of dying’ (27%) is in the minority in the NDE thematic analysis – yet the ‘sense of dying (17-22%) in DMT is resonantly prevalent, which, at least in this proportion, reflects the DMT as echoing the concept of death in a direct manner.

The entering into ‘other worlds’ was notably higher on the NDES for the DMT participants, and echoing was claimed by a full 100% in the thematic analysis, versus NDE descriptions

of iconic imagery as organised into scenes at only 42% – which likely reflects many of the NDEs as showing only shallow, initial features, as opposed to the high-dose DMT experiences with ‘breakthrough’ intent. The emergence of ‘natural scenery’ (e.g. verdant vistas), however, was very similar between the states (11%, 12%), with the idea of it being an idealised mirror-image of earth (Shushan, 2018) being common in both – though this was often of fractal or hyperdimensional content in DMT. The couple of quotidian instances of queues or offices was also absent from DMT, too. Hell-resembling spaces were manifest in 6% of NDEs, including rivers of damned souls, which again weren’t observed in DMT. Descriptors of ‘heaven’, on the other hand, were used twice in the NDEs, where the concept of entering the realm of the spirits was also resonantly raised once by a DMT participant (LG).

Not present in the NDEs, the theme of being ‘between spaces’ (in limbo/waiting) was somewhat higher in the DMT reports (11% vs 3%), and where this was expressed as a period of darkness, the DMT experient appeared in a state of suspended animation compared to the NDEs in which they moved through it (to light). While a blackness which emanated light occurred only once in the NDEs, it never did in the DMT trips (however, this did transpire in both the 2 cases of changa in Chapter 7 of this thesis).

Significantly higher for NDEs on the NDE scale, the sense of a ‘life review’ also only occurred in one DMT participant on two occasions (6%) compared to 24% of NDEs in the thematic analysis. This only very conceptual and feeling-oriented DMT report contrasted with the explicit judgement by either oneself or accompanying entities, and one’s life being physically represented in the NDEs (e.g. a film). However, such representation is seen in other changa accounts (Chapter 7) – albeit whose content was in the more idiosyncratic form of ‘code’ (yet, again, such content is comparable to one NDE herein whose life was embodied in some ‘brain-like’ structure).

A sense of profound love, sometimes unconditional, was curiously uncommon amidst the NDEs (9%), while this was felt in over a quarter of DMT reports (28%) normally as received from benevolent other beings. Identically in terms of prevalence, the ‘lucid-dream-like’ process of the experient being capable of wilfully altering elements of their unfolding experience was uncommon in NDEs (9%) and markedly higher across DMT interviews (28%).

No DMT report at all evoked a semblance of a ‘point of no return’, whereas such an unbreached threshold was signified in 9% of NDE narratives. Equally, no item indicating a phase of ‘returning’ to life is shown on the NDES (despite its commonality), but is illustrated by 56% of NDErs and none of the DMT subjects whose experiences eventually only dissipate. All of this echoes, again, the absence of a distinct and functional episode of messages by other entities of ‘sending back’ the experient (as well as by psychopompic beings to ‘take away’), which seem quintessential only to the state in which one nears death.

Some DMT content themes are not illustrated in this table due to lacking an NDE theme to be compared with. This may be due to their being genuinely absent from the NDE narratives, or due to the NDE narrative analysis (even when extended) being much less nuanced and in-depth than the DMT analysis, which in turns stems from using written narratives for NDEs versus in-depth interviews for DMT. The table of Appendix C (3.) delineates all these DMT themes not shown in the first table (Table 4) above, where the orange highlighted cells signify the lack of coding (second reason for absence, in prior sentence), and all the remaining (unhighlighted) themes represent those authentically absent from the NDE (first reason).

As such, in respect to these *highlighted* themes, they should not be considered as fundamentally not to be found in the near-death experience repertoire, and certainly many of them are sometimes evident across the NDE narratives herein. For example, as regards the ‘roles’ and ‘demeanours’ of the entities, as coded in the DMT analysis (Chapter 3), some entities of the NDE narratives still may have included soothing, healing, or orchestrating beings, who may be benign, beautiful, powerful or familiar. As regards the ‘emotional’ feelings or ‘bodily’ sensations (Chapter 4), while they were included in Cassol et al (2018), due to their being repeated themes across different categories, generating frequencies and thus comparison with the DMT reports was impossible. These themes, however, were spanning absence of body, thirst, extreme cold; positive emotions of happiness and serenity, well-being, confidence, release, astonishment, amazement, absence of pain, curiosity; and challenging ones of presence of pain, fear, unbearable sadness, exasperation; and finally indifference. All such themes (except thirst, cold, pain, and indifference) were present in the DMT reports (to degrees observable in Table 4 above) – where, notably, the

comparative prevalence of positive to negative emotions was not significantly dissimilar between the DMT and NDE states, with approximately 4 DMT participants, and – approximately – 3 NDE narratives suggesting significantly distressing episodes.

Many of the DMT themes will be paid attention to in the following which are *unhighlighted* in table of Appendix C (3.) i.e. those which were coded in the DMT analysis yet not present at all across the NDE narratives (the first reason stated in the last paragraph for their absence in table 4 above). For example, and not exhaustively, (from themes in Chapter 3) all entities characterizable as clown-like, alien-resembling, mythological, sentient structures/objects; entities (or indeed other worlds) with qualities like transforming, geometric/fractal, hyperdimensional, holographic or organic-mechanic; or which communicated visually, imparting specific messages (surrounding oneself or the world) were entirely absent from the NDEs. Additionally, all descriptions of the otherworldly space, like regular human worlds, outer-space, artificial scenes, infantile scenarios, or grid-like spaces were equally missing. Similarly, explicitly organic, technological, geometric, or symbolic/glyphic items were not apparent. In terms of themes at onset of the DMT trip, and the sensorial, and psychological experiences occurring (in Chapter 4) – all onset features (submergence, the rush, anxiety, pain, reality break-down etc) may not be in the NDE narratives, yet these may be symptoms of the initial effects of drug administration. Equally, it is of note that virtually all NDErs do not elaborate on such initial building of their experience and instead seem to ‘awaken’ (from unconsciousness to consciousness) to a scene. For similar reasons, no open-eye experiences (energy, break-down) are reported in the NDE, yet the fact that synaesthesia or (non-musical) sounds are also not reported is of note. Finally, cognitive disturbances and contraction of time were also not reflected in the NDEs.

Thematic analysis of the DMT experience: “Near-death Experience, Death & Birth” and Qualitative comparison with NDE

Canonical NDE Themes

The ensuing section represents the final component of the thematic and content analysis of the DMT experience from the field study of DMT use. The following table (Table 5) presents all levels of themes described, except final subthemes specifically for the ‘mystical experience’ and extra clarificatory notes, which are listed fully in the table of Appendix C (4.). Below this is a graphical representation of these themes (also minus the subthemes; and also available in the appendices, Appendix C 5.). This first category, entitled *Canonical NDE Themes*, has at least one of its themes identified in a full 34/36 interviews, representing 94% of all experiences. All emergent themes were inductively coded from the data, but the final stage of collating a subset first into this category of typical themes (and as such, separating them from *Less Typical NDE Motifs*, see below), was guided in a *post-hoc* manner by their presence on the most updated, standard measure of assessing near-death experiences – the NDE-Content Scale (Martial et al., 2020). Thus, the analysis itself was not directly influenced by prior conceptions, but a reliable phenomenological reference was utilised to ensure a justified split between canonical and ‘less typical’ themes. This itself assisted a more systematic comparison with the raw data from the narratives of near-death experiences shared by Cassol et al. (2018), whose final themes are closely reflective of the content of NDEs. In the following, the DMT themes are delineated, then accompanied by a comparison of the precise nature of their qualitative content with that of the NDE narrative data. This process is divided into ‘Similar content’ and ‘Different content’.

Table 5: Thematic Analysis of the DMT Experience: An Encounter with Death; Tabularisation of categories, super-ordinate and subthemes explored in the present article – See Appendix C, 5. for list of all subthemes, including for Mystical Experience

AN ENCOUNTER WITH DEATH

Themes	No. Interviews /36 (%)
<u>Near-Death Experience, Death & Birth</u>	
<i>Typical NDE features</i>	34 (94)
Disembodiment	19 (53)
Translocation elsewhere	12 (33)
Tunnel-like structures (During)	10 (28)

Bright light(s)	9 (25)
Sense of dying (During)	8 (22)
Tunnel-like structures (At onset)	7 (19)
Sense of dying (At onset)	6 (17)
'Limbo-land' / The Void	4 (11)
Light Being-esque	3 (8)
Deceased family	2 (6)
Hyper-empathy	2 (6)
Life-review-like	2 (6)
<i>Less typical motifs</i>	<i>14 (39)</i>
Birth imagery or Being born	5 (14)
Death imagery & Skulls	5 (14)
Sounds (At onset)	3 (8)
Reduced fear of death (after-effect)	3 (8)
Etheric body	2 (6)
Being in prime	2 (6)
Partner lying dead	2 (6)
Dark & earthy space	1 (3)
'Placebo-death experience'	1 (3)
Psyching the Psychopomps	1 (3)
Scenes on screens	1 (3)
Repulsed by body	1 (3)

<u>The Mystical Experience</u>	
<i>Typical mystical dimensions</i>	<i>29 (81)</i>
<i>Entheogenesis</i>	<i>3 (8)</i>

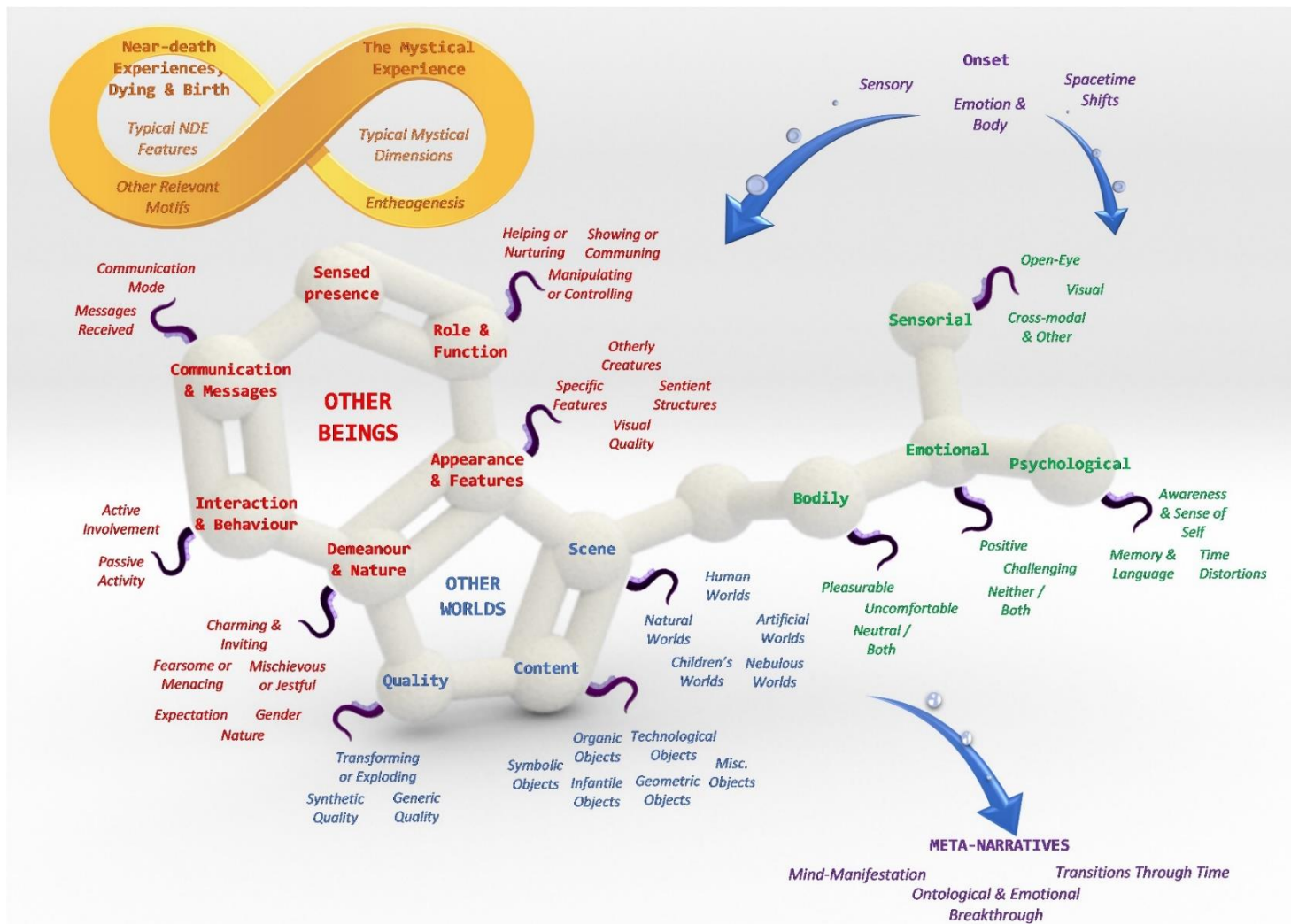


Figure 2.3: Categories, super-ordinate and mid-level themes from the present DMT analysis (upper left) – including those of *Encounter with the Other* (Chapter 3), and *Encounter with the Self* (Chapter 4)

Similar content

Bright light(s)

A vision of bright light (or lights), specifically very intense and usually uncoloured, was described by 9 of the 36 participants (25%). LR (25-29y, M, Chinese-Italian – Dual) here recounts:

“...this really bright light – it just got really bright, OMG. I’ve smoked DMT a few times, but not bright light like that, it was so bright that the colours were melding into whiteness. It was almost like someone was shining a torch in my eye, but without the pain”

GR (25-29y, M, White Romanian) describes it similarly, but most importantly at the very onset of his experience, in the context of darkness, and passing through it to enter the following phases of his journey (also mirroring perinatal regressive imagery, see *Less typical NDE motifs*, below):

“Just darkness, then a bit of light. Literally as if I’m, you know, putting my hands in the dark space and just like ripping it a part... or you know coming out of the egg... Or the womb!... Just like *swoosh* through it”

The feature of ‘light’, which may be intense and attractive, was present in 25/34 NDE narratives (74%).

Sense of dying (At onset, and During)

The very sense of dying, subtly distinct from the belief of actually being dead, only expressly reported by one case (LG), was described by 6 participants (17%) *at the onset* of the experience (that is, when it is usually articulated by classic NDEs), and 8 (22%) continuing *during the unfolding* of the trip. RH (55-59y, M, Asian British – Indian descent), in his second experience, shares the challenging nature of it (which is not the norm in near-death studies) – accompanied by the fracturing of his sense of self (ego death being much less common across the NDEs, see *Quantitative comparison*, above):

“Dying at the beginning; pain, confusion... I seemed to be in what felt like death really really quickly this time, it was quite horrifying. But...this time it was only a few moments.

It started with softly opening up patterns, like very beautifully coloured blankets, started like that, but then all of a sudden, into the death bit.

Interviewer: So it was really like piercing through the veil?

Yes exactly like that... The dying bit is the worst bit of not knowing. That’s when I don’t know who I am”

Comparatively, the ‘awareness of being dead’ amongst the NDE narratives was present in 9/34 cases (27%).

The void / 'Limbo'

Again, associated with his sensation of dying, as well as ego-death, *RH (2)* expounds on an experience of a void-like space, or “limbo-land”, shared in 4 interviews (11%). Here he presents a challenging, inescapable and content-less scenario imbued only with warped feelings of inversion. The theme of *Translocation*, i.e. the sense of moving from one’s original space to another one entirely, reported by 12 people (33%), often as a “sucking” or a “magnetisation”, is also included here:

“Oh its horrifying, terrifying, horrible... You know, stuck in a place that I just don’t want to be in... a feeling of being sucked was in there as well somehow. Being sucked somewhere.

Ah, it felt inevitable, there was an inevitability about it which seemed really important. I knew there was no way out of it... Terrible powerlessness, this inevitability. I’m gone, I don’t matter anymore... that consciousness is completely different to the one I know now...

It’s always got a jagged, fragmented quality...its already broken... suddenly a feeling of being sucked, somewhere around that point, I felt stuck...in this fragmented place. And that always happens, always happens. That’s the terrifying bit, it’s not here and not there. It’s absolutely limbo-land... It’s just not a place I know, I just don’t know it. Nothing makes sense...

probably only a few seconds... It felt long. It felt...forever long...almost a torture”

Empty and inescapable darkness was reported in 13/34 (38%) of NDE narratives (with one, 3%, stated as a ‘waiting room’).

Despite the above – Dying, Light, and Void – being significantly echoing of the experiences as described by classic near-death experiencers, they cannot be easily conceptualised using the two dimensions of structure and content. The themes themselves lack much if any scope for variability and subjective manifestation, and thus can only be said to mirror NDEs by their phenomenological structure, and not necessarily by their qualitative content – which would otherwise render them more impressively akin to the NDE.

Different content

Most remaining themes under the category of near-death experiences coded in the present analysis were, further to the themes above which mostly lacked scope for variance in content, possessed such a scope but demonstrated patent differences in such content.

Disembodiment

Firstly, this can be evidenced by the theme of disembodiment, at least overtly described by 19 (over half, 53%) of the participants. While this effect will be evident in many excerpts used in this analysis, some examples involve being “completely dissolved” (*AN, AF, FF*), “just pure thought, no sensation of my body” (*LR*), or “merging of my body with the scene” (*MP*). This is in sharp contrast to the classical description of ‘out-of-body experiences’ (OBEs) at the onset of NDEs, demonstrated in 12 (35%) of the NDE narratives, in which one feels their consciousness detaching from their body and ‘move’ elsewhere, in all cases here accompanied by looking at their body (‘autoscopy’). *EM*’s DMT experience, under *NDE-like cases* below (in full Appendix C, 6.), is especially illustrative of this clear distinction.

Patient *CG_fmp80* is a prime example, where during a 1990 cardiac arrest at home, he finds himself “outside my body...3-4 meters from the head” in the form of a “small cloud, a vapor”. He reports allegedly veridical perceptions (where 27% report observing the scene and 9% with possibly corroboratable elements), including seeing his son crying and shouting next to him, and states that “through the walls of the house, I perceive my wife, who is outside [the house]...impatient with the arrival of the help”. He also claims witnessing a “spider in its web in a top corner of the room”, until he his loaded on a stretcher and “pushed back in the corner where the spider is”, realising that when originally seeing it, “this corner was hidden from me by a bay that separates the room into two and I couldn’t [have otherwise] seen it”. During a later tearing of the artery in a coronography examination of June 1995, he reports another impressive OBE:

“When I wake up, I see my four-legged teacher on top of me, performing cardiac resuscitation... I'm here, in this operating room, unconscious, since under

anaesthesia... There is the anaesthetist, my treating physician, a surgeon, the teacher, nurses and a lady who is not very active at the moment, and speaks a lot. In a vulgar voice she says what seems to me as nonsense about the situation everyone's going through. Some laugh, others are unmoved. My GP, who is also a friend, is rather serious. In fact, they just lost me!... for quite some time I've been in my "cloud" and watching all this little world that is busy around my body... I perceive the...activities of all and their feeling of failure, even panic. Feelings I don't share. I feel calm and peaceful but the words I perceive hurt me. I see through the bodies my own body in its entirety gutted, the blood and that cold that materializes but that I do not make out. I see myself open in two, exposed there in a blinding white and raw light”

Tunnel-like structures (At onset, and During)

Experiences of tunnels, or more accurately, structures or imagery evocative of the idea of a tunnel, was reported by 7 volunteers *at the onset* (19%) – and 10 *during* (28%), i.e. *at subsequent phases* of the experience, where the tunnels initiating the trip tended to remain as a feature throughout (importantly, not something seen in actual NDEs). For instance, LR's (25-29y, M, Chinese-Italian – Dual) concept of 'portals' was echoed multiple times through his DMT trip:

“This person...walked in front of me, then he opened, he had his hand [on] this portal, this bit in my mind, he opened it up...just opened this portal, and I was flying through these dimensions...

the guy came back the second time...he grabbed one of these points and kind of pulled it, then it opened this portal... there were many portals, I was just flying through them...

there were all these points and each of these points would lead me to the next dimensions, and I was just going through all the portals at once almost”

AF (40-44, F, White Italian) describes moving toward a tunnel, in quintessential NDE fashion – though again, in the context of “female entities”, who as she says, were “inviting me...[to]

this sensual game of shape and colours... flirting with me. Their body was changing shape” (manifestly not present in NDEs):

“There was a tunnel, yellow, pink and blue and there were curves [in it], and at the end of the tunnel there was the usual geometrical shape I always see... I was moving towards the geometric multi-dimensional cube and the entities were telling me to enjoy and to play with them going towards the cube”

Incidentally, these features of ‘geometric hypercube’ and being led through by playful feminine entities, integrated with the tunnel phenomenon, was shared by at least one other subject, *DD* (40-44y, M, White British):

“So the cuboid, splintered, fractal thing, is sort of this tunnel-type thing, and she [the entity] started off as 2D, then there was definitely the face, and sort of like the whole body was drawing me through it... So as this splintered backwards, this then became the tunnel... So she is beckoning me backwards through this cuboid tunnel-type vortex thing (laughter)!”

As regards the NDE narratives, a ‘tunnel’ (in one case, corridor), which specifically was leading to light, was displayed in 9 (27%). Similarly, a ‘dark tunnel’ toward light was found in 3 (9%). The NDE of *FR79* was exemplary of the light at the end of a classic-looking tunnel, at her experience’s onset:

“Like all ‘experiencers’ who have been through this kind of vision, I see the big light this time... a circular light giving a tunnel feel because of the darker, circular centre too. The whole thing seemed alive and very powerful; but not blinding, there was no heat. Without suction or projection, I crossed the tunnel at full speed. Speed is not the right word because there was no movement. The impression looked more like a dissolution of my person and an equally sudden hatching. A lightning crossing of sorts”

Light being-esque entities

An encounter with an entity resembling the so-called ‘being of light’ was evinced by 3 DMT participants (8%), though again, for the most-part, with very clear departures from the

classical description. This is most-readily demonstrable in *RH's* second trip (his first being more typical, see *NDE-like cases*, below):

“Extraordinarily beautiful. I don’t know if I cried but the intensity of it was just amazing, the feeling of love somehow. Fascinating how I knew I was separate, I knew this wasn’t me, and I wasn’t a part of it – and yet...we knew each other? Yeah, we definitely knew each other...this was a familiar thing somehow... Without any doubt...extraordinary intelligence, and I don’t mean sophisticated technology, I just mean, beyond anything I can imagine really...

Just a profound sense of love, the most profound sense of love... He knows, I guess, is just what I’m trying to say, he knows...

Wonder, shock, profundity... I’m not curious. I’m just with it, I know it is incredibly beautiful and I’m familiar with it... a feeling of it being familiar, not being a surprise... a real gentleness that it had... the feeling of profound love is always there, and the speed seems to be something like, that, not more than that [gesturing gracefully with arm]...

this entity, if you told me it was made of 1000 beings I'd believe you, it doesn't feel like it's one, even though it only appears to be one thing, it's almost like it's consciousnesses or something... it is something like a [hive mind]... Either it's so massively intelligent I'm struggling to find words for it, or it's like a conglomerate”

The following elaboration clarifies such stark deviation in content to classic NDEs:

“...almost tentacled... lots of colours, I remember particularly yellow, green. The closest I can get to it is either like my imagining of what synapses look like, synaptic nerves and stuff, or something a bit octopusy? But that would just make it very-... an entity which certainly had quite a lot of things reaching out all over the place” (RH: 55-59y, M, Asian British – Indian descent)

In this way, the being illustrated shares the common qualities of beauty, benevolence, familiarity, hyper-intelligence, profundity, grace – emanating a sense of sacredness (see Appendix C, 1., ‘The Mystical Experience’) – with classic ‘beings of light’, but evidently of a decidedly alien quality.

Of all the narratives of NDEs, 5 (15%) exhibited meetings with such light beings. *Patient 73* mentions that “a little supernatural”-looking people, “wearing shiny white gowns (I felt like they were doctors)” appeared. However, *BJ_fmp319*, after waiting in “a queue...a bit like the supermarket”, with “quite a few people” (presumably other ‘deceased’) in front of an immaterial “counter... [which] seems to produce this resplendent light”, describes a dramatic encounter with:

“a gigantic, white, totally white guy: whiteness itself, resplendent with almost white light alone, a being of light (no, whiteness) he is so surrounded and drowned in white that his face has no colour. He is very imposing (like Barry White!), huge, strong, he wears a long white beard, long white hair, ageless.

He does not seem aggressive or unsympathetic, despite his imposing personality, he rather gives a reassuring and benevolent impression... Obviously he's directing or deciding something... Obviously, he knows me from my case and my record. I think I can see an expression of kindness on his white, almost paternal face.

In a tone without appeal, without brutality or animosity of any kind, he addresses me:

"Hello [*BJ_fmp319*]," he thunders. In fact, he doesn't speak to me: I hear his voice inside me... "Sorry, it's not your day!"

As such, this being presents all the attributes of an anthropomorphic light being, yet wanting for any sci-fi-esque qualities – and which fulfils the roles of sending the experient back, in an especially clerical manner. This being said, one DMT participant, *AV* (45-49y, F, Brazilian), briefly paints a picture of preternatural light, as if it were itself another omnipresent consciousness, much like as offered in typical NDEs – albeit, once again non-typically described as a mandala (though, the Tibetan Buddhist *Bardo Thodol* does describe entities in the *Union* phase of *Dharmata* after death appearing as luminous mandalas, Sogyal, 1992):

“I was drawn to the centre of this mandala... The yellow and the white colour was very strong... I never had a DMT journey without the entities, there was no entities there. Woah!... It was like being *inside* the entity... the rays, the yellow, white, like inside the sun... Like pure light... It was a white core... It was spinning”

Deceased family

The encountering of the deceased was evoked by only 2 DMT participants (6%) – where notably both instances were of known people and specifically family members. However, *SP*'s example was extremely fleeting and ambiguous, whereas *JM*'s (35-39y, M, White British – Scottish) was unmistakable. Naturally, his also presented in a way not customary to NDE accounts, referencing framed “magic mirrors”, but more damningly, comicality in a wider context of elf-like (mercurial, mischievous) entities displaying a “dismissal of death”. He also highlights the strange arising of this directly personal content (in fact, more akin to NDEs) which was out of place for his previous DMT trips:

“My mum popped up, which was weird. She’s dead, you know... I’ve never had such a direct link to something personal before, so that was interesting. But done again in a kind of comical way, there’s a lot of comic stuff in there! A lot of distraction...

She was in a frame, a bit like a magic mirror, like Snow White or whatever. And she was quite happy, again everyone was in a good mood, for whatever reason! It was quite jovial. There were maybe hints that it could get dark, but there was a kind of impression, of *Oh don’t worry about that, that’s not your concern...*

She seemed to be in good spirits. And she had no hair...because she had cancer... But I’m just sucked away, and it was fractured and odd, but definitely her”

Amongst the narratives of NDEs, 8 (24%) of them included experiences of the deceased. *Patient 26* first related the following, characterising all the themes of darkness, malicious entities, and a river of lost souls:

“The whole background was black... I also saw shapes, human-looking but without heads... The whole atmosphere was very scary... I was on a kind of canoe, which followed the current of a very black river. I was on my way to a bridge, where the headless shapes stood. They were pulling other people from the canoes that passed under them. They ripped their nails off and tortured them. It was really horrible”

This is congruent with NDEs of the distressing-type, and such elements as monstrous entities are readily observable within the DMT universe. Suddenly, an ancestor of his then

appeared, and though also echoing the *Deus Ex Machina* motif shared in the present DMT analysis (*AN, RH*) – the ancestor functioned as in classic NDEs to send the patient back, from a treacherous to a beatific place:

“I saw behind me my deceased grandfather. It was very dark, but it was illuminated by a kind of light which I could not see the origin of. He said, ‘There is nothing here for you, kid!’... I found myself at the top of a hill, overlooking a huge place, composed of forests of fir trees and flowers. I felt an indescribable wind, filled with happiness. The sky was full of beautiful colors, which I had never seen before... There was no suffering”

Life review-like

The reanimation of experiences or feelings from one’s personal history, a ‘life review’ of sorts, was volunteered in two DMT interviews (6%), however both of which being derived from one person, *SP* (35-39, M, White British). Here, in his first trip, he offers that:

“I was seeing faces of loved ones mainly, and feelings for people. But it was very worldly, not really anything abstract or weird crazy things... there was a feeling of universal- it was lots of love and it was like the absence of fear, the absence of fear kind of seemed to be a pure loving experience... this feeling of being aware of my own consciousness, that was the kind of overall- it was about me, and I guess everything that connects through me, or I’m aware of...”

More like a narrative, like *Life*, *Voom*, all your experience is, that’s what happened, *Voom*. So it was really fast... It was pleasant... it felt alive and real, very real. Was it like dying? I guess!...

Like a round circle of all the ‘stuff’. But I presume it was my experiences and I was witnessing those. But it was in a kind of, it was bowl-like, and not like I could see connections, but like there were little windows every so often. I remember looking at you and this idea of basically being able to look at myself, like I was looking at myself through you!”

8 NDE narratives (24%) included reviewing or reliving 'life events'. While a feeling of re-experiencing one's life as portrayed above is reproducible across real NDEs, even with this DMT account the content is not the same as those of the NDE narratives – in which whole life-scenes are vividly relived with greater tangibility, sometimes accompanied by a guiding being or at least a sense of appraisal.

For example, patient *BJ_fmp319* first reports his hovering over his own surgery, witnessing his open cranium and the surrounding medical devices, until he is “caught in a lightning whirlwind of images” which he had forgotten and yet were sharply vivid, where he “can precisely choose to stop” at a scene as if it were “in the cinema... a movie summary”, concluding with the painful separation from his wife and tearful daughter he felt were “related to my deep sense of guilt, and that I am not very proud of my conduct”.

Patient73, referring to doctor-like and shimmering 'supernatural-looking' people, expressed that he was presented with a “model” of his life (which may suggest peculiar tones echoing DMT imagery):

“They showed me passages from my life, from my childhood to my present age, projecting the scenes in front of me on a kind of table. It felt a bit like a view from above, as if I were looking at a model. For example, I saw the company where I worked, its roofs, the trucks coming in and out, all in every detail. But they showed me a lot more negative than positive scenes. Each time they pointed out to me my mistakes, my bad decisions and suddenly destroyed the model. They seemed to mean "Did you see him [i.e. myself]? Well, you won't see him again!" It was unbearable, like a judgment but with the punishment of having my life swept away with every mistake I had made... I felt the consequences of my bad decisions very strongly and I felt worse and worse as the scenes went on.

Then they tried to forgive me and make me come back into my body... It was then that a bright light appeared, like an extremely strong sun”

After acknowledging his having died, accompanied by a sudden painlessness, *JYB16* reports the following – in which an intelligent 'brain-like structure' encoding his own, or life at large, was encountered (which again may mirror the stranger of DMT motifs):

“The atmosphere is sweet. A universe that has no walls and where there is no question of gravity. A kind of great place in dark metallic grey tones, as if to infinity. A wonderful sensation occurs when a kind of *over-brain* comes over my head like a hood of exceptional intelligence. This intelligence is universal or global... [I am] only an intelligence, nothing else. Thus, thought is free from any material, bodily, human, and therefore petty possibilities... Indeed, by the time I receive this new form of intelligence, I find before me – my life. I look at this thing in 3D that is my life, and that doesn't ‘unfold’; time is ‘integrated’ into it, it is not linear. Everything in this life is visible and this "global" intelligence allows us to read it, to conceive it... my intelligence allows me to look at my experience and draw conclusions... The real truth is there, unavoidable. The "last judgment" is done to oneself...: 1) I was a good man. 2) My life was useless, I didn't do what I had to do...

When I was in front of my life, I had a "whorl" of pink-orange metallic colour because it was illuminated. Enlightened by herself [the intelligence], by her "existence." Its oblong shape resembled that of a brain seen from above with creases, waves. All I had to do was change my perspective to see another part of this life... And it seemed possible to me to be able to choose a moment or character to integrate myself into it. But I didn't need it. The order of things was that I had to first take stock of my own life... Only one image comes back to me sometimes, I was a little child, in shorts, and "illuminated" like a pure being. I was appalled that I had finally done nothing with this life. At least, not what I had come to earth for. Sometimes I have the idea that I was summoned for this observation, and only for him. So as to understand later the signs that will be sent to me”

A further pertinent point of distinction between the DMT and NDE states, in the context of the life review, may be the emphasis in the above NDE excerpts on regret for not using one's life well, a felt sense of guilt, or explicit appraisals cast by accompanying beings. This reflects an existential onus on the values of free will, personal responsibility and the enactment of positive deeds – but where the judgement is mostly *self*-derived or served by eventually forgiving agencies, and so aligned with a framework of humanistic, compassionate non-judgement. Such a process is especially well-emulated even within the second NDE extract above, and appears to echo Zaleski's (1987) noted progression from at

least medieval near-death narratives through to contemporary ones, wherein a viscerally judgemental and hell-like experience is seen to reconfigure toward a rehabilitative and educational one (in turn, reflecting social structural transformation over time). This may all be contrasted, then, to many DMT experiences being essentially 'playful', seen in St. John's (2018) use of 'ludibund' (from Latin 'ludere' meaning 'to play') in reference to this – but expressly to the sentiments encoded in the *cosmic game* communication by DMT entities (Chapter 3), especially AF & SH's reports. SH, below (while not a life review per se but still evoking an evaluation of meaning/values/deeds), in contrast to the above NDE example, portrays a flirtatious female entity, playfully inviting her to accept the message that the universe is intended to be 'yours to do as you will' and enjoyed in light-heartedness, without objective rules or scrutiny:

"It just felt so playful. And I was thinking, What's the message!? She was like 'Don't be so stupid, there is no message'. And I just couldn't stop laughing! She was just like 'It's just a fucking game, just play it! It's an infinite game and you can make up the rules! Just play the game...it's here to have fun, you can't win it, you can't lose it, you're just in it. Just play! And she was playing with me... I had these questions in the back of my mind about my life. And it was just going 'It doesn't matter!! Stop it!! Just be here now!' And it felt really like it was Shakti just putting on this performance for me like, 'Isn't it fucking amazing, like existence, just Wooooo!'. It was beautiful and...the whole of life felt so silly. And in a nice way, not like Oh it's silly and pointless, it was like 'It's silly, and that's it!!! Like, Enjoy it, Wahooo!' Like life's just a fair-ride, a rollercoaster, something to enjoy... Like everything was everything; all is one, it's all just the same stuff, putting on a show, and we make these differentiations but they're not really there" (SH: 30-34y, F, White British)

This suggests a dissonance perhaps between a moral versus an amoral cosmology between the states, where the former regarding NDEs was enshrined in the experience which inspired Moody to write *Life After Life*, in which George Richie was asked by a being of light during his review, "What have you done with your life?" later interpreting it as "How much unconditional love have you given others" (Ritchie & Sherrill, 1978). Somewhat countering this, however, the DMT trip can sometimes also include a charge of a mission, or exhortations to love (and even to educate) oneself and others (Davis et al., 2020; Chapter

3). Lastly, an excerpt from the *Epic of Gilgamesh*, strikingly reminiscent of the encounters of *SH* and *AF*, and further illustrating such a way of comparing these communications, is included in Appendix C, 9.

Hyper-empathy

A form of 'hyper-empathic' experience, in which one experiences the states of those known in life and the nature of their relationships, was also very much entangled with *SP's* 2 (35-39, M, White British) life reviews (again, present only in his experiences). This is evident in his above description, especially the final phrase, but elaborated here:

"That whole trip was just...so 'round', the experience was like I could feel- I was going through the connections between, I don't know, my world and the people inside it, and it was beautiful... this feeling of wholeness, oneness... I went into the experience basically saying- giving myself to the universe... it was like a mirror of love" (*SP*, 2)

"It was this feeling, like we were a collective organism... this thing about all humanity, human consciousness... it felt like I was literally experiencing loads of other people's consciousness...this feeling of literally just it all coming through, like not my own sadness, [but] other stuff, and just letting it run through you" (*SP*, 1)

While this special element to the life review has been emphasised in previous literature, it was not as overtly evident throughout the NDE narrative data (however, still partly evoked by the above NDErs' feelings of empathising with how their behaviour adversely affected their loved ones).

Less typical NDE motifs

Some themes under this final category of *Less typical NDE motifs* have already been described in the above analyses, and 14/36 (39%) participants articulated at least 1 of these. These are motifs which may either be related in some sufficient way to the idea of death (or birth), but are, by definition, not identifiable on new standardised measures of the near-

death experience (Martial et al., 2020). This is compared to the first category (*Canonical NDE themes*) whose features were clustered by their presence on this scale. As a result of the lack of presence of these motifs in the DMT analyses, regarding the comparison of each of them, in terms of content, to the raw narratives from the qualitative analysis of the NDE (Cassol et al., 2018), only very few comparisons will be discussed below. These are the motifs of 'birth imagery', the 'etheric body' and 'sounds', as these are the only three which are partially present in the analysis of the NDE. Regarding experiential content, they appear different to the accounts of the NDE analysis, except for 'etheric body'.

Birth imagery (or being born)

Some perinatal imagery or feeling of being *in utero* or born – not in the sense of the generic (e.g. shamanic) rebirth trope as in a, literal or metaphoric, progression from darkness to light – was evident in 5/36 DMT instances. We have already touched on *EM's* "between birth and death" state, as well as *GR's* emerging light from the dark being "like a womb". Two others also make reference to the womb, such as *ZD's* statements that "I felt like I got sucked down into something... Just almost like in a womb of something else" but then qualifying this more as "like dropping into this round bottomed and narrow necked vase", thus also associating it with a tunnel-like feature – which is akin to the perinatal regressive theories of NDEs (e.g. Grof, 1985).

The only reference to something of this nature in the NDE narratives is with patient *BJ_fmp319*, directly after being sent back by a being of light from a heavenly space to their diseased body:

"...my life passes through me again, and I travel the whirlwind in the opposite direction from just now until *before* [italics added] my birth. But I can no longer stop scrolling, although I am for a moment curious to see my birth and especially to try to capture my sensations of that moment"

This excerpt's content, being in the context of a life review, is thus more explicitly about the witnessing of the experient's actual birth, and thus evidently different to the more symbolic representations of the DMT subjects.

Death/skeletal imagery

The same number of interviews, 5 total, incorporated some overt reference to symbols or concepts invoking the idea of death. These included *JM's* (35-39y, M, White British – Scottish) dalliance with trickster-like presences, gesturing to skull imagery in a kind of farcical atmosphere but while generating an intense air of mystery:

“Not a lot of menace this time, but a lot of hints at death but in a comical way... Definitely hints at death, which is quite specific, but in a mocking way...

A constant feeling of being pointed to *look over there*, but you know you shouldn't, like a trick... And as I said the death thing, hints at the skulls, but they're being laughed at and dismissed. This is the most specific message...

Some of it was jovial, with little bit of menace... Again about 'the secrets', *Have you seen the thing?*... yeah, a definite point of dismissal of death, so that's a communication”

Sounds (At onset)

We've previously noted *JB's* “rushing, breaking-through, noise” initiating the DMT experience, with such sounds expressed by 3 persons in total, including *GR* stating a “buzzing and ringing in the ears”. Compared with the NDE narratives, sound was experienced by the authentic NDErs only once, and was associated with movement through a tunnel, similar to *JB*. While this suggests the sound feature to be very uncommon in NDEs, it is similarly uncommon in the present DMT analysis – and thus in this way, the two experiences may be considered consistent. However, the sounds in the NDE were of “machine noises” and actually relatable to the hospital equipment.

Etheric body

Again, *LG's* simulacrum of his physical body in “energetic form” was seen above, mentioned by only 2 in total, the other being *MP's* reporting his state as “out of this body...but in an

etheric body". The NDE narratives evidenced 3 instances of an etheric body, again similarly uncommon compared to the present DMT interviews. Very redolent of *LG*'s experience of being able to doubly see from a 3rd-person perspective his semi-transparent body after witnessing the scene of his own body's "death", so does NDE experient *FR79* appear to describe her translucent body from a detached perspective as well as her original body:

"I found myself split into two parts. My body was resting in bed and from the top of a 'cloud' I could see myself. My double on the bedroom ceiling was witnessing an extraordinary scene in sharpness and authenticity... And me, a little higher [than others witnessed near a river in another world], lying in the gallows bed – and sorry, again, me a little higher, on a translucent and solid cloud"

Partner lying dead

As a subset of participants were also part of an experiment in which two of them underwent the experience in tandem, *MS* recounts that she had a vision of her partner appearing dead – present in 2 instances (of the 11 cases of partnered experiences). She additionally illustrates a kaleidoscopic display of skulls, exemplifying again the theme of death imagery:

"She [partner] was lying there, her dress, everything. She's got all this plant stuff and animal life on her. She was dead in there, she was dead... She's got a dress on, and something on with leaves, and just flowers and plants. She was levitating, and they were holding here up, all those plants on her clothes were holding her up...

There were skulls, so many skulls coming up every now and then... the bloody maze...the vividness and colours, I was just getting skulls... the skulls were the first bit...[around them] was just fractals of moving energy"

While seeing the dead in NDEs is very common, and seeing the living uncommon, seeing the living, including those in your surroundings or having the same experience, *as* dead is never observed. This being so, these partnered DMT reports are somewhat akin to cases of 'shared' or 'empathic death experiences', in which a healthy person close to the dying reports participating in the dying's experience (SCRI, 2021), or more than one person nears

death and one returns to report witnessing the other(s) in their experience (who ultimately die).

'Psyching the Psychopomps'

This final theme has been termed 'Psyching the Psychopomps' (psychopomp's being the supernatural agents charged with carrying souls of the dead to the afterlife), on account of the one participant below, LG (30-34y, M, Mixed British – Sri Lankan-German descent), implying, in discussion with the interviewer, a more literal or transcendentalist interpretation of the experience. Specifically, that DMT may enable the experiencer to enter the realm to which the dead belong, but where upon arrival the entities presiding there are confused or acknowledge some form of mistake (i.e. appropriately expecting those who have died, not those having a drug-induced near-death-like experience):

“[The entities] were coming out of the walls, swirling out, and melting back into it

Interviewer: So you had an interaction with them?...

Yeah, no communication, but glances

Interviewer: But recognition, they were aware of you, you were aware of them

Definitely

Interviewer: And they were specifically coming to check you out?

They were paying attention. I wouldn't say they were particularly interested, but they were like, “hmmm”

Interviewer: 'There's another one'? (impersonating the entities)

Yeah, basically! (laughter)

Interviewer: 'Is he dead?', 'No, it's just DMT'

'No, he's going back, just a flying visit'

Interviewer: ...Yeah! They must get that a lot"

Another resonant experience to this one is reported by *MP* in a journey not during the present field study of DMT use, but in a separate laboratory study of I.V. DMT while undergoing fMRI neuroimaging. He reports an appearance of benevolent guides, functioning as ferrymen, who conveyed (via ticker tape) that he is immortal. They themselves exhibited a panicked state out of concern for *MP*'s safety, concerned that, to have penetrated to this space, he must be dying. He ensued to act as the reassuring party, ironically, for them, assuring them that his life was not being threatened (*MP, personal communication, 11th September 2021*). This, though, may well be owing to suggestion, where although the beings showed anxiety about the strange machine and hospital environment in which they found him, this may instead reflect *MP*'s own priming of potentially being in a vulnerable state surrounded by researchers concerned for his welfare. However, Luke (*personal communication, 26 April 2021*) was also contacted by another DMT experiencer, describing her experience in which "the praying mantis appeared, spoke telepathically with [her] in a way in which she could hear saying "Is she dead? No, she's just on DMT", then proceeding to "do some operations on her body to retune things".

Comparable to both these experiences and their interpretation is the quintessential NDE theme of 'the return', in which NDErs are usually compelled to go back, as if the experiencer is 'not supposed to be here, or to be dead', and the classic message communicated upon return is a variant of 'It isn't your time/Go back', as seen here in 7/34 cases of NDEs (see Table 4 above). Here, *LG* and *MP* are not 'sent back' *per se* – and that is a theme patently absent from DMT trips, as established in the above section on *Content comparison* (albeit, see Davis et al., 2020 where 4% received a reprimand, sometimes including a sending back) – but nonetheless there is still the sense of something being awry, as far as the entities show in their demeanor and intentions, and similarly, the experient is not 'truly dead'. This mistake may, again, be likened to the return being due to a 'clerical error' often reported in Indian and other Eastern NDEs (Pasricha & Stevenson, 1986). Naturally, the difference being the DMT experiencer has self-directed the emergence into this space with an exogenous drug, versus the spontaneous state of almost dying.

NDE-like cases

In referring to Appendix C, delineated there are some *Canonical NDE themes* and their content from a small selection of participants whose overall experiences appeared to be consistent with NDEs in a more compelling way than the rest (see Appendix C, 6.). Large segments of whole interviews are included there for 2 participants, *LG* and *EM*, also including a subsequent communication by *LG* to the author (PM) of a valuable elaboration on his experience. Such consistency with NDEs implies possessing more NDE-typical themes, their content may on occasion be more NDE-like, or the sequence of events may be more reminiscent of the typical syndrome (or a combination therein). This being so, ultimately, the nuances of the qualitative content are still almost always, especially for *LG* and *EM*, idiosyncratic or stereotypically psychedelic/DMT-like. A very brief listing of the themes for these 2 participants specifically, covering both the *Canonical NDE themes*, as well as some *Less typical motifs* and other NDE-relevant content encompasses the following: *LG*'s DMT experience entailed a sense of dying, disembodiment, translocation elsewhere, an etheric body (associated with levitation and autoscopy), a tunnel-like structure, reassuring entities, and grief over his 'death'. *EM*'s experience incorporated a sense of dying, sense of familiarity, disembodiment, tunnel-like structures, benign and protective entities, a natural landscape, and a light with no source.

The content, however (please see Appendix C, 6. for full reports), of said themes in both trips manifestly differed from those of actual NDEs in the following ways: *LG*'s hallucination of a cardiac arrest scene (which was not objective), a holographic and vertical icicle-shape (which moved, vs himself moving through it), and alien-like faces of entities (who were confused as to his being in the 'spirit world' after taking a drug). Regarding sequence, the sense of moving from the emergency scene to a tunnel, which itself constituted some preternatural world in which the entity encounter, occurred essentially simultaneously – which is not akin to, at least deeper, NDEs, where the tunnel serves a distinct transition before a 'breakthrough' into the 'otherworldly' stages. As for *EM*, she claimed her sense of dying only derived from a feeling of being poisoned by the DMT, she explicitly states her disembodiment was not like an OBE, the tunnels echoed barber-shop spirals (moving similarly to *LG*'s, which also remained through the duration of the trip), the entities were

dancing, body-suited harlequins, and the garden was intricately adorned with Mosque-like motifs. She also reported creating a three-dimensional hexagon (which she claimed was mathematically impossible) during her vision – where complex (even normal) geometric shapes are not native to NDEs but DMT lore. The sequence of her features was somewhat more consistent with NDEs, progressing from disembodiment to tunnels and the encounter, until arriving at a garden of light – though, similarly to *LG*, the tunnels were always present (again blurring the commoner NDE motif of the tunnel breakthrough to elsewhere).

The Mystical Experience

A brief continuation of the thematic analysis specifically focussing on the classical mystical components of the DMT experience can be found in the Appendix C (1.). This is situated in the appendices owing to these themes not directly contributing to the discussion of the DMT-NDE parity, since the core mystical state, arguably by definition, is ‘without’ content, As such (comparably to the themes above of Bright light(s) or the Void being structural elements without much content variability) is not readily differentiable between the DMT and NDE experience, where it is a given that such mystical themes are the same between the two. This is paralleled by the finding that responses to the mysticism scale and to the near-death experience scale resulted in a significant converging of the two supposedly separate mystical and NDE constructs, where only 3 features preferentially loaded onto the NDE factor (Bruce Greyson, 2014). And in this way, the mystical components could be said to drive, or even over-emphasise, a great deal of the purported similarity between the two experience types.

Discussion

Idiosyncratic NDEs

Despite one overarching conclusion of the present chapter being DMT’s manifestly unique presentation of the structural features in their specific content versus the NDE – it would be remiss of this treatment to not establish that there are indeed, still, some components of

some near-death experiences whose content may be indistinguishable from DMT (or other psychedelics). Some examples may express superficial similarities, such as fractal-geometric motifs, for instance, 30 year-old *GJ* described a series of three near-death events in the space of 5 weeks – where, importantly, his case is a neurodiverse study given his congenital time unit-spatial and numerical-visual synaesthesia, highlighting differential NDE content, in this case geometric patterns, across neurological conditions. Firstly, he reports an NDE from anaphylactic shock to prawns involving geometric visuals (ceasing after loss and recovery of consciousness); two weeks following this, an NDE after septicaemia, likely from a fly bite, entailed similar entoptic patterns for 3 hours; and finally undergoing another NDE after a lightning strike throwing him 15 ft., again incorporated beautiful and terrifying entoptics for 30 minutes in a blinded state (Luke, *in preparation*).

Regarding geometric-type objects of a more complex nature, the phenomenon of encountering a ‘wheel’ (or carousel) of some description traditionally associated with lore from effects of the kappa-opioid receptor agonist (and thus dynorphin-mimicking) *Salvanorin A*, have also been reported during NDEs: “I stared at a huge dark wheel, with stars and other celestial bodies, which slowly revolved”, “I could clearly see a mandala. This wheel rotated very slowly, and I had the feeling this wheel could not be stopped... A...relentless movement”, “I rode with the Universe of God in the wheel of life, and I became a spoke in the wheel. The Universe was the centre” (P. Smith, 2019). *Wilson*, during a car crash, also reported an NDE wherein he observed an object which:

“resembled a giant water wheel lying on its side, and rotating... it was larger than...the world... I had seen the object before, and I will see it again when I die. And that was why I was seeing it now... I was about to be subject to the process approximated as ‘reincarnation’. This was why the wheel had come. I represented a kind of discrepancy that had to be fixed”

He alludes to this experience being part of the wider phenomenon of the alleged ‘Mandela effect’ in which people allege to have passed into a parallel universe, continuing that “I saw variations on possible world outcomes where I died in the crash. The wheel didn’t seem bothered one way or the other...all it cared about was sorting me, and there was a kind of ruthlessness to this”, claiming that he then found himself “back on the highway...a very short distance *back* up the road still approaching the intersection [i.e. prior to his accident]”

(Smith, 2019). While apparently very atypical for experiences near-death, such wheel-like encounters are mirroring of Biblical prophecy (Ezekiel 1), and Hindu (The dance of Shiva), and Buddhist cosmology (The karmic cycles of *samsara*) – and a parallel image, the ‘spindle of Necessity’, was recounted in the Myth of Er by Plato (c. 350 BCE) in his Republic.

Progressing from wheels to cube-like forms, Judson & Wiltshaw (1983) report on a man with CNS-implicated lymphoma becoming comatose, later recounting an NDE of positive tones amidst a “rocky...sandy...high plateau” with a sky of “pale gold”:

“I am standing ‘in the shadow’...of a great rock. My shape is more or less that of a cube, but is in process of transformation, perhaps toward a globe. I am a living being and my life is bliss and utter rightness, but a greater bliss and discovery of being are immanent”

He is eventually administered 0.4mg I.V. naloxone (an opioid antagonist), and consequently the atmosphere takes a negative turn, as he, presumably, deliriously confuses his assisting doctors as “aliens” trying to “abduct me into their world”. The “cube” in a state of “transformation” is resonant with the 5 cases of ‘hypercubes’ in the present DMT analysis, and that he in fact identifies himself with it is identical to the report of participant ST (Chapter 3). Other instances of geometric constructs in NDEs include Hou et al.'s (2013) report on the NDEs of three survivors of brain injury, one of which encompassing a structure of light appearing as “a form-changing creature, which could smoothly flow from one 3-dimensional geometrical structure into another”, and as the experient “moved towards [it] by flying, [it] continued to move away as it flowed from one structure into other”, until it approached and finally engulfed him. This transforming geometric light-structure is, again, replicative of the self-transforming entities or objects (19-22%), most of which geometric (8-22%), in the present DMT study (Chapter 3).

Mirroring a near-death experience separately reported by participant ST (Michael et al., *in preparation*), in which he gave one interpretation of the light-filled space inhabited by entities showing him symbolic script as being within a spaceship, and further emulating the sci-fi motifs of the DMT sphere – one participant of a VR exhibit (Montemayor, 2016) described a previous NDE which involved crawling through a never-ending maze of “tunnels” which were inside of a “spacecraft”. Additionally, Luke (*personal communication*,

26 April 2021) was contacted by a playwright who reported encountering an entity with “a thousand eyes”, an entity similarly confronting DMT participant *RH* herein (see Appendix C, 6.) – where many-eyed divine beings associated with death are an evidently cross-cultural archetype (Luke, 2008). The near-death experience of Victor Solow, after a heart attack rendering him clinically dead for 23 minutes, was reported in a 1974 edition of *Reader’s Digest* (Schlieter, 2018). He articulates that he was “moving at high speed toward a net of great luminosity. The strands and knots where the luminous lines intersected were vibrating with a tremendous cold energy” – also serving as a new manifestation of the threshold perhaps emblematic of advancing technology, stating “the grid appeared as a barrier that would prevent further travel”, echoing another modern NDE in which the experient came to a “force-field” until being forced to return due to “not having the right information” (Witting, 2010). Not wanting to move through the grid, he slowed down until arriving inside the construct – suggesting some lucid-dream-like control. Upon making contact with it:

“a vibrant luminosity increased to a blinding intensity which drained, absorbed and transformed me at the same time... The grid was like a transformer, an energy converter transporting me through form and into formlessness, beyond space and time... This new ‘I’ was not the one which I knew...had no connection to ego. It was final, unchangeable, indivisible, indestructible pure spirit... at the same time, part of some infinite, harmonious and ordered whole”

Such a picture of a grid of light is reminiscent of the DMT trip of several participants (e.g. *GR, SH*), of ‘blueprint’-like or ‘axes’ designs – but extraordinarily more evocative of Solow’s NDE is the, now well-known, high-dose LSD experiences of visionary artist Alex Grey (Grey, 2004) inspiring his work *Net of Being* (and similar work such as *Oversoul*) which depicts a ‘universal mind-lattice’ comprised of intricate strands of flames (complete with eyes and galaxies), and is itself resonant with the Buddhist concept of Indra’s Net. He describes it as representing ‘all individuals as nodes in a network’, which rings also of Solow’s ‘indivisible spirit’ reconciled with being part of an ‘infinite whole’ (and further echoing of *ST*’s NDE above which also included being ‘one with the white light yet separable from it’).

Finally, the *Bardo Thodol* (as described in *The Tibetan Book of Living and Dying*, Sogyal Rinpoche, 1992), which in fact was partly constructed from reports of so-called ‘Deloks’, that is, Tibetan folk reporting NDEs – delineates the four phases of the luminous bardo of

Dharmata, which one must transit through if failing to originally recognise the Ground Luminosity at death. This represents an “unfoldment in which mind and its fundamental nature are gradually becoming more and more manifest... through this dimension of light and energy...mind unfolds from its purist state, the Ground Luminosity, towards its manifestation as form...in the bardo of becoming” (in turn, echoing the wheeled NDEs above suggesting reincarnation, as well as the light-grid of Solow’s NDE facilitating interchange between form and formlessness). This, explicitly, demonstrates the fundamental tenet of Tibetan Buddhism of the forms presented upon death being mind-dependent, where the action of psychedelics is, centrally, to ‘manifest the mind’. But pivotally, the second of the Dharmata phases, the *Union* (or *The Deities*), is the process wherein (again, if recognition is not made) “the luminosity manifests in the form of buddhas or deities... the forty-two peaceful and fifty-eight wrathful deities... taking on their own characteristic mandala pattern of five-fold clusters”, which also appears synaesthetic as “the brilliant light they emanate is blinding...the sound is tremendous, like the roaring of a thousand thunder claps”. This is almost identical to DMT trips in which beings, often speculated to be complex emanations of one’s own psyche (Luke & Spowers, 2018), seem to coalesce out or into geometric mandala-like forms (and very redolent too of the McKennian ‘Self-transforming machine elf’) – where the mandala itself is considered, from a Jungian perspective, to be symbolic of the Self upon final individuation (Jung, 1969). Lastly, Sogyal writes that “From yourself and from the deities, very fine shafts of light stream out, joining your hearts with theirs. Countless luminous spheres...increase and then roll up...into you” – which is echoing, also, of another elf-encounter on DMT wherein the “elves sat on top of me, shoving in all this light, into...my solar plexus”, and an independent report in which they were “pouring a golden, viscous liquid...into the middle of my abdomen” (Luke, 2013b).

As regards the NDE narratives utilised in the present study, one patient in particular reports two near-death experiences which could be considered especially idiosyncratic in contrast to the other 33 cases. It is one of the, perhaps, only two narratives of an overtly distressing nature, in its inclusion of the experient encountering an initially malign entity, and being taken to a hellish realm amidst a river of lost souls (similarly reported by DMT participant OD). The narrative is expressive of content possibly indiscernible from DMT, which predominantly centre around the manifestation of the entity, entailing the appearance of a

face and hand, which functions as an archetypal trickster, in its deceptive, luring behaviour (reported also by *DD*), who performed 'psychic surgery' on the experient (reported by *RV*) – and who may be characterised as a 'being of light' in its shining appearance, yet its black form and ambiguous role crystallise again the DMT-like content. Other features observable both across typical NDEs and several of the present study's DMT experiences, however, encompass telepathic communication with said entity, a *Deus Ex Machina* motif (reported by *RH*), lucid-dream-like control, sense of hyper-reality, clairvoyant-like perception, a black void, intense fear, attractive, white light, unconditional love, and paradoxical black light; as well as after-effect motifs such as a sense of revitalisation, ontological shock, and a transformation including relief from addiction, enhanced spirituality, and no fear of death. Lastly, fewer elements are more strongly aligned with typical NDEs, involving an autoscopic OBE, the entity being given the descriptor of 'God' or 'Holy Spirit', a 'cord of light', the patient being stopped at a threshold for fear of 'contamination of the light', and finally being returned to complete a mission.

The aetiology of the near-death episodes is active and passive suicide attempt (which corresponds to the communication of 'contamination' above). The majority of the narrative transcript can be found in Appendix C, 7.

Summary

Considering the triangulation of modes of approaches to the DMT-NDE question – neurobiological, psychometric and qualitative – the present study can speak to the latter two. The NDE scale results above showed all DMT experiences here to 'qualify' as having a near-death experience, and according to the frequency analysis of themes, all DMT reports also possess many individual features of the NDE – highlighting that DMT is capable of potentially reproducing all elements of the structural phenomenology of the NDE. However, it was evident from both those quantitative approaches, especially the thematic analysis, that some features are significantly less inducible by DMT and more endemic to NDEs – encountering the deceased, the life review, and threshold of no return – which could be considered those most emblematic of nearing death (where the threshold feature, of note, scored significantly higher by NDErs in Timmermann et al., 2018 before the conservative Bonferroni correction, and was entirely absent from DMT in the thematic analysis). While on

the other hand, some features are indeed more inducible by, and so perhaps more defining of DMT, such as encountering other beings, including non-human/non-animal beings, and entering other worlds, or dissolution of ego (core to the classical mystical experience). That these specific features, elements also of the NDE, are thus so deeply characteristic of DMT suggests too that they may act as primary drivers of the DMT-NDE overlap. The approximate third of both NDE and DMT experiencers in the thematic analysis reporting a feeling of dying (though perhaps unexpectedly low for NDEs or high for DMT) is one other crucial level of DMT's near-death-like composition. Lastly, preternatural light, the tunnel effect, and disembodiment were all higher, but not substantively for NDEs versus DMT, which tend to correspond with the commonest and early stages of NDEs.

In terms of the lion's share of the present study – the qualitative content analyses, over and above the frequency analyses – final conclusions include that virtually all the DMT reports' content on this subtle level was not typical of NDEs, and was rather idiosyncratically 'DMT-like'. This concept is encapsulated almost perfectly by the attached quote on Watts' own DMT experience at the start of the present chapter, depicting the structural element of the tunnel phenomenon (as typical in NDEs), yet remodelled with a stereotypically DMT-resembling finesse. In short, such content unique to DMT (and not NDEs) could be distilled as encompassing bizarre (albeit distinct from the bizarreness of REM dreams which are hyper-associative and often non-sensical), kaleidoscopic, extraterrestrial, transcultural (i.e., not pertaining to one's own culture), non-biographic content. The relatedly more artificial, sometimes infantile, and overall more archetypal or atavistic (including mythological) qualities of DMT also define its content (which are elaborated in Chapter 3). The NDE, in contrast, is typically of a more predictable and personally-pertaining nature – such as the life review, or when culture-specific content is present, this is almost always congruent with that of the experiencer. As for other modes of comparing the two states, like dynamics or intensity, the DMT experience is certainly of a more fluctuating, prolific, and overwhelming nature, contrasted to the NDE which at least appears to be of a more stable, somewhat circumscribed nature and, though intense, not excessively so. The sheer prodigiousness of DMT content may also possibly account for at least some imagery pertaining to death to inevitably arise, given the archetype of death being so deeply fundamental to the human, and mortal organism's, collective psyche.

A minority of DMT experiences here had at least one feature, or a small cluster, with NDE-typical content – such as a sense of dying, the void, or the light. However, as discussed above, these lack an ability to be parsed into the dimensions of structure *and* content, so again, DMT could still be considered to not uniquely reproduce these components. No DMT report in this study consisted of the fuller syndrome of the kind of content constituting most NDEs, nor did any follow a repeatable sequence, which may be observable to a degree in some NDEs. In this way, overall, at most DMT may be considered an *occasional* and *partial* ‘NDE-ogen’ (reproducing an NDE with high fidelity). However, more accurately, DMT could be conceptualised as an ‘NDE-mimetic’, on account of the vast differences in content. Given the as yet only preliminary, indirect evidence for its release near-death, and the infinitely more multifaceted biology occurring near-death, the NDE-mimetic term is analogous to historically describing DMT as a psychotomimetic, after its physiological implication in psychosis was unsupported and its phenomenology only superficially mirroring psychosis. All this said, as discussed at length above, it is important to remember that some NDEs themselves do have more ‘idiosyncratic’ content, and as such, DMT may well reproduce these types at the level of nuanced content, and so may also be biologically implicated. And finally, a group of DMT experiences were identified here which were comparably ‘NDE-like’ in nature, especially *LG* and *EM*, though whose content was still of an idiosyncratically DMT quality.

Explanatory models

The general conclusions of the present study may be distilled into essential sameness of phenomenological structure (with some prevalence discrepancies), but major difference in qualitative content, between DMT and NDEs. Neural accounts, that is, ‘bottom-up’ approaches, may be best poised to account for similarities in the phenomenology – yet, one need not invoke DMT release in such a direct way. Such broad features are likely elicitable by many other physiological or otherwise neural mechanisms which converge downstream, yet may be triggered in independent ways. For example, *Salvia divinorum* acts via agonising the Kappa opioid receptor, ketamine acts via antagonism of the NMDA receptor, and classical psychedelics, like DMT, act via activation of the 5HT-2A receptor – yet all are shown to significantly disintegrate the Default Mode Network (DMN; *Salvia*: Doss et al., 2020;

ketamine: Bonhomme et al., 2016), and this more large-scale end-point (and other concomitant neural activity) may lead to the two experiences' shared phenomenology (such as entrance to another world or mystical states). Comparably, despite these differential initial mechanisms, the claustrum is also shown to be inhibited by both *Salvia* (Stiefel et al., 2014) and psilocybin (Barrett et al., 2020; where its connectivity to DMN and task positive networks is also altered). However, DMT itself could theoretically biologically contribute to the similarities in content seen in this study (Dying, Void, Light) – yet, as mentioned, these features may be better considered on the level of phenomenological structure. Again, given the fact of some NDEs certainly presenting with, even DMT-resembling, idiosyncratic content, it could be considered that DMT may be implicated biologically in such NDEs as these.

In terms of accounting for differences in the content, psychological, that is, 'top-down', models may be best considered. The evidential discrepancies in context between the DMT trips occurring in a planned manner in experienced participants' own homes, compared to spontaneous NDEs occurring to unwitting individuals having life-threatening experiences (often leading to hospital settings), would certainly involve expectation effects. Such effects are naturally enhanced by the psychedelic experience itself, and any potential implication of endo-psychedelics in the NDE would also itself enhance such influences from 'set and setting'. Even specific features more common across the NDEs versus the DMT reports, namely the deceased, could be related to such processes. This being so, it is important to note that NDE-like experiences (e.g. via hypnosis, drugs etc) without such classical NDE suggestions were found to be the same as real NDEs (albeit only phenomenologically, possibly less sensitive to suggestion, Charland-Verville et al., 2014), and also, only a minority of NDE experiencers seem to be (consciously) aware that they are dying at all (Cassol et al., 2018; Pim Van Lommel, 2002). Likewise, many DMT participants in the present study believed that they were dying, yet for the most part the content was differential to NDEs – but of note, almost all of the above described NDE-like cases of DMT participants did have intense sensations of dying at onset. Naturally, different conditions of NDEs would mean different levels of conscious recognition of being near-death (e.g. spontaneous heart-attacks or accidents, versus suicides or protracted illnesses), where in the less expected cases (conscious) suggestion effects would be less likely.

Looking at the neural level, however, could well also account for the, albeit less predominant, *differences* in structure (presence of certain features in NDEs and relative lack in DMT) as well as *similarities* in content. A fundamental point to be highlighted, and why the neural model may confer greater explanatory value, is that in the near-death state *proper*, there are vastly more complex and elaborate conditions underway, in stark contrast to the simple deluging of exogenous DMT into the brain upon personal use. This will be covered in significant depth in a subsequent report (Michael et al, *in preparation*), especially elaborating on these observations about the phenomena of the tunnel, the OBE, the deceased, ego death, dying sensations and more, including the overall possibly more circumscribed content of NDEs. One crucial example, however, includes Li et al. (2015), who evidenced that in rodent models at least, a litany of neurotransmitters were substantially elevated upon asphyxiation, which if translatable to human near-death may be unlimited in the ways in which this may explain the NDE phenomenon. Serotonin was initially increased X20 versus baseline, Noradrenaline X30 and Dopamine X12, and Glutamate X3, which are interestingly the systems which classical, other monoaminergic psychedelics and ketamine upregulate, respectively, which in turn exhibited the greatest semantic similarity with NDEs (Martial et al., 2019). Though salvia (containing salvanorin A) was also semantically linked to NDEs, the endogenous transmitter it mimics, dynorphin, was not measured by Li et al, yet it is implicated in emotion and hallucination and is elevated during cellular stress (Nichols, 2018). Most saliently, a X250 increase in serotonin was seen at 4 minutes post-asphyxia, where serotonin may possibly have psychedelic properties (Schmid & Bohn, 2010), and thus could itself be a primary endogenous inducer of the NDE.

DMT's potential role in the NDE

The question of the neurochemistry of the near-death experience as indicated by the present qualitative analyses, as well as a host of established literature on complex neural processes during both animal model and human death (to be elaborated in a subsequent report, Michael et al, *in preparation*), is clearly more than just a question of endogenous DMT. Briefly, not only does this consist of mass exocytosis of a plethora of neurotransmitters (Li et al., 2015), but also high-frequency, gamma range cortical activity in humans (e.g. Auyong et al., 2010; Chawla et al., 2017), which is of global coherence and

synchrony in many rat models (e.g. Borjigin et al., 2013). This consideration can presage a so-called death of the 'dying brain paradox' of NDEs (wherein not only conscious, but elaborate and lucid experiences are possible during a time of ostensible neural impairment), and a movement instead to a *hyper-functional* 'dying brain hypothesis'.

In specific regards to the feasibility of the implication of endogenous DMT to NDEs, it was originally assumed that such DMT, which is identifiable in the peripheries in humans (Barker et al., 2012) and in the pineal in rodents (Barker et al., 2013), would be shuttled to the central nervous system (CNS) during such moments of extreme stress like at near-death. However, the MAOs intrinsic to the peripheries would act as a significant blockade to reaching higher concentrations, and as Dean et al. (2019) has identified, while capable of producing DMT, the pineal organ is not necessary for DMT elevation at cardiac arrest. As importantly highlighted by Nichols (2018, 2017) too, the evidence is extremely poor that there is a CNS uptake mechanism for DMT, but regardless, concentrations at which endogenous DMT exists are orders of magnitude lower than that necessary to produce psychoactive effects, and if secreted by the pineal gland, an insupportable proportion of the mass of the gland itself would need to contain sufficient DMT for such effects. The enzymatic machinery (INMT-AADC co-localisation) requisite for DMT synthesis appeared not to have been investigated in human brain tissue, while it was identified in rodent brain (Dean et al., 2019), however Borjigin in Borjigin & Chavez (n.d.) does suggest that phylogenetically such metabolic apparatus is generally conserved. Nichols & Nichols (2020) crucially stress the extraordinary increase (X250) in serotonin levels from baseline reported (Li et al., 2015), which in light of the only approximate X6 elevation in DMT (Dean et al., 2019) as well as that serotonin has much higher affinity for the 5HT-2A receptor, it is likely that DMT has a limited role, if any, and that serotonin itself may be a better candidate in terms of NDE production (if it is indeed psychedelic, Schmid & Bohn, 2010). Dean (*personal communication*, 17th December 2019), however, continues to rebut these diminishment of DMT's contribution, highlighting that their microdialysis sampling technique may underestimate the quantities of DMT, that the sampling rate was only at 15 minute intervals where greater concentrations may occur prior to (or after) this (vs. e.g. Li et al.'s, 2015, 1 minute intervals), and that they tested only the occipital cortex where DMT may be a much more globally recruited compound.

Finally, Borjigin & Chavez (n.d.) also comment that despite the structural or functional damage which may be incurred to the brain in near-death states, this may in fact confer a greater capacity for DMT to exert its psychedelic effects despite the above critiques of said capacity. For instance, any plausible hypoxic destabilisation of the DMN already occurring may make this 'easier', since DMN disintegration is a core neural mechanism of DMT's effects (Timmermann, 2019) – though this destabilisation itself may lead to psychedelic effects without the need for endo-DMT, in a way echoing the neural hypotheses mentioned above. This mirrors the present author's own speculation (Michael et al, *in preparation*) that the interaction between significant brain activity near-death and released DMT may be important in NDE phenomenology. This, however, is in contrast to recent suggestions that there may be lesser sensitivity to psychedelics in DoC patients, and by extension those in coma-like states such as near-death, due to a possible requirement of specific, intact neural systems for complexity increases by psychedelics to occur or influence consciousness (Gosseries & Martial, 2020).

In short, it may be argued that it is not physiologically feasible for DMT to contribute to the NDE, it is at least a much more nuanced picture than merely DMT release, or indeed that it need not be DMT given downstream mechanisms converging on similar phenomenology. Thus, the quest continues for DMT's part to play in the NDE.

The question also remains that if indeed DMT (or other endo-psychedelics) are involved in the NDE – although DMT release has evident neurogenic, neuroprotective and anti-inflammatory effects (as described above) which would have been favourably selected for as a physiological survival stratagem – why should the release of any chemical with such properties also prove to have such profoundly baroque, psychedelic and mystical, or even experiential effects at all? Some partial response to this may be that the *experience* of the NDE *per se* has prosocial effects – where, for this (and other) reasons it may have been replicated via inductive methods by shamanic societies (Shushan, 2009) – and similarly the shared 'meme' of returning from near-death with such an experience may have historically lead to coherence between the community (Lake, 2019). Thus the NDE may have conferred genetic propagation advantages, eventually coming to constitute an 'inherited predisposition' (Lake, 2019) – where, though 'experiences' of those not returning from death cannot be known, by definition, near-death experiencers are survivors, and so the

NDE (including its physiological elements) may confer survival benefits. The positive group influence of NDEs is akin to suggestions that the entheogenic psychedelic experience amongst indigenous groups is employed to secure belief transmission across members for similar binding purposes (Dupuis, 2021). Equally, if paralleling psychedelics and NDEs – the plethora of evidence for the transformational effects of the psychedelic *experience* is also indicative of the advantageous sequelae which may bear on such evolutionary adaptivity. For example, therapeutically, mediated by the mystical experience (F. S. Barrett & Griffiths, 2018; Haijen et al., 2018; Roseman et al., 2018), or by other mechanisms like insight (Davis et al., 2021) – or in other domains like personality (Griffiths et al., 2008; MacLean et al., 2011).

Additionally, the massing evidence of the psychotherapeutic and personality changes via the occasioning of mystical states by psychedelics may also support the evolutionary value of their endogenous release. Specific features of the NDE such as the life review may also be a conserved mechanism due to possibly representing the brain's attempt to search the repertoire of past experiences to avoid the threat of death (in predictive processing terms, to select across cortical priors to explain the cause for the novel sensation of dying and finally generate action for survival). The dissociation and analgesia such substances can produce are evidentially valuable psychological advantages for the protection of the experiencing self in near-death conditions. The possibly innate inheritance of these features, then, should imply that they are universal – however, the life review has been noted to be a phenomenon only in cultures with dominant religions (e.g. Kellehear, 1993), although analogues may be found in other, e.g. small-scale, societies expressed as some form of judgement (though, again, this is difficult to consider a biological effect). Finally, the very fact that all NDErs by definition are survivors, including the many reported instances of 'spontaneous remission' of disease (e.g. Khanna et al., 2018), may suggest the phenomenon's evolutionary selection. That is, the highly adaptive nature of the bodily reaction in the stressful near-death state – which may include the above discussed endo-psychedelic release for tissue preservation (as well as a likely serotonergic response, which itself also induces a highly plastic and thus adaptable brain-state to accommodate the stressor; Carhart-Harris, 2023), and in turn correlating with psychoactive effects expressed

in the form of NDEs – clearly confers bio- and psychobiological survival advantages, then manifesting as sudden remedying of the near-death aitiology.

Clinical application

The question of the clinical utility of DMT is more extensively addressed in separate studies (Chapter 3, 4), but the level of comparability the experience has with NDEs may itself have therapeutic implications. The NDE is known to confer a host of beneficial changes in wellbeing and personality, such as lesser fear of death, greater sense of spirituality, reduced psychopathology, and concern for others and the world (Groth-Marnat & Summers, 1998; Pim Van Lommel, 2002), which seem to be uniquely linked to the subjective experience (Greyson, 1981, 1992, 2001; Greyson & Khanna, 2014). Thus, as Michael (2022) emphasises, if psychedelic experiences during therapy were more reminiscent of NDEs, such positive alterations may be even more robust (where also discussed is, given the evident parallels between DMT/psychedelics and NDEs, NDErs themselves are also in need of sufficient preparation and integration of their experiences). Owing to this analysis' conclusion of DMT best being conceived as only an NDE-mimetic, substances offering better modelling of the phenomenon should be investigated, or even synthesised or combined as a mixture where different pharmacological profiles could contribute to different experiential motifs (this is discussed further in Chapter 7 regarding *changa*, and mentioned in the final Discussion chapter regarding *ibogaine*). High-dose psilocybin, for instance, may be a reliable inducer of NDE content, when the active psilocin, highly chemically similar to DMT, breaches such 'breakthrough' thresholds typical of DMT use (Michael, 2022). Ketamine is also a commonly referenced compound in terms of its evidentially very NDE-like nature (Martial et al, 2019; Dakwar et al, 2019) – though endogenous analogous compounds are still elusive, and some evidence is based only on unsystematic case studies (Jansen, 2001), or over-inflate the comparability due to methods used (Corazza, 2008).

On account of any NDE simulating drug being defined by themes of death and dying, and not least a key-most effect of NDEs' being diminishing death anxiety (Bianco, 2017; Bianco et al., 2019), such a treatment may most germanely be used in terminally ill patient populations – where psilocybin has already been shown to produce significant and

sustained reductions in existential anxiety (Agin-Liebes et al., 2020; Ross et al., 2016). This said, some evidence points to a host of ostensibly distinct psychopathologies being unified in their partial causation by death anxiety, explaining psychedelics' impressive transdiagnostic effectivity (Moreton et al., 2020) – though, the possible inherence of existential concern, the extrication of ritual, and the over-medicalisation of the concept and treatment of death and suffering is highlighted as important caveats to consider with such psychedelic end-of-life care (Dutta, 2012; Varley, 2019). Finally, if indeed serotonin is psychedelic and is mainly responsible for the NDE, serotonin itself could be administered intravenously to patients – albeit, blood-MOA would rapidly degrade it, and such high-doses (as that reported in Li et al., 2015) could risk serotonin syndrome. However, co-administration of a MOA inhibitor could surmount the degradation, and some highly selective synaptic serotonin increases, such as raphe nuclear stimulation or reuptake transporter reversal (such as one component of MDMA function), may be feasible, despite serotonin syndrome risk.

Limitations

As far as limitations regarding the present study's comparative analyses specifically between NDEs and *NN*-DMT experiences, one example may be the restriction of the sample of near-death experienter narratives being from western French-speakers, meaning a lack of content from cross-cultural sources. As regards the 'idiosyncratic' NDEs above, and their ability to diminish the major content differences highlighted here with DMT, the inclusion of such cultural differences may have similarly lessened this gap given their more distinct or unique nature in contrast to western NDEs. For instance, NDEs within a Chinese sample, most of whom were Buddhist, demonstrated many qualitative peculiarities redolent of psychedelic trips such as a transforming, geometric creature of light (Hou et al., 2013). An extremity of this process may be NDEs of indigenous societies, who are characteristically shamanic and often employing entheogenic substances, and as such the NDEs are more specifically expressed mirroring their encultured psychedelic journeying (Shushan, 2018). This being so, given the DMT experiences in the present study also being of modern westerners, the comparative NDE sample was necessarily also of this demographic – yet future studies are indicated to include more socioculturally diverse populations. In similar

vein, the NDE narratives used originated selectively from classical near-death experiences with proximity to death in anoxic conditions. This is in comparison to those of other varying physiological states near-death, or anticipatory near-death ('fear-death') situations, or indeed NDE-like cases (e.g. syncope, epilepsy, hypnosis etc), whose content may well be unique and exhibit different similarities and differences to the DMT state – but future research should be carried out to explore this hypothesis. In fact, certain NDE-like conditions may be better technically simulated by DMT, given DMT being one of many such inducers of an NDE-like experience, in the absence of the complex physiological cascade which transpires at real death. Focusing in depth on one of the many possible models, in this case DMT, was a necessary pragmatic decision for conducting a comparative analysis.

Additionally, the near-death narratives comprised of several times less volume of written content compared to the DMT structured interviews, where if richer NDE interview transcripts were compared with – as in the case of chapter 7, comparing changa and NDEs – the more nuanced content may have altered the comparison in an unforeseeable direction. This links to another possible limitation, where the present study did not generate a thematic analysis of the NDE but rather utilised and partially modified one already extant (Cassol et al., 2018), including its raw qualitative data. This may have created discrepancies in the styles of thematisation, including a lack of one-to-one relationships between themes – yet corresponding themes between the DMT and NDE analyses were identifiable for all features (see Table 4).

Chapter VI:

This is Your Brain on Death: A Comparative Analysis of a Near-death Experience and Subsequent 5-Methoxy-DMT Experience

Introduction

The case study presented in this chapter centres on a Caucasian North American male, age 54, popularly recognised (Alexander, 2012) and clinically documented (Khanna et al., 2018) to have had a near-death experience (NDE), originally reported to score 29/32 on the Near-death Experience Scale (NDES). His NDE transpired during a 1 week coma, between 10th-16th November 2008, precipitated by high-fatality bacterial meningoencephalitis resulting in Glasgow Coma Scale scores of 6-11 (<9=deep coma; further clinical details are reported in Khanna et al., 2018). This chapter represents a systematic, comparative qualitative analysis of his NDE and subsequent experience with the potent (endogenous) psychedelic drug 5-methoxy-*N,N*-dimethyltryptamine (5-MeO-DMT). While predominantly evaluating this particular substance as a model of the NDE, this analysis may also bear on its potential role in the induction of the near-death experience.

5-MeO-DMT

5-MeO-DMT (hereafter also called 5MeO) is a fast-acting indoleamine with greatest affinity at the 5HT-1A site, found within the *yopo* snuff from the *Anadenanthera* bean of the Amazonian basin (also containing *N,N*-DMT and Bufotenin) and in the bufotoxin of the *Bufo Alvarius* toad of the Sonoran desert (alongside Bufotenin). Recent studies have indicated that 5-MeO-DMT may produce mystical-type acute effects as well as have therapeutic utility, in ways already highly comparable to the near-death experience. Vaporised, inhaled bufotoxin has been shown to induce 'complete' mystical experiences in over 75% of experiencers, equivalent in intensity to high-dose psilocybin reports (Barsuglia et al., 2018). Such mystical experiences from synthetic 5MeO are also found to be significantly higher, as are enduring effects of meaningfulness, spirituality and wellbeing, when conducted within a safe and supportive structured setting (Sepeda et al., 2019), echoed by the use of 'benefit

enhancement' strategies elevating acute mystical experiences and long-term sense of personal meaning and spiritual significance (Lancelotta and Davis, 2020).

In studies of use in naturalistic settings across Europe, improvements in life satisfaction, depression and anxiety have also been evidenced post-5MeO experience, usually sustained at 4 weeks, most of which correlate positively with levels of ego dissolution (Uthaug et al., 2019). In this study, affect and non-judgement were similarly improved for at least 1 week, which correlated with quality of psychedelic experience, alongside reductions in salivary levels of cortisol and pro-inflammatory IL-6 (Uthaug et al., 2020). Furthermore, an online survey of users of 5-MeO-DMT in structured group settings identified that depression and anxiety improvements are again shown to be associated with greater reporting of enduring sense of meaningfulness and spirituality (Davis et al., 2019). A case study of the enhancement in mood and cessation of alcohol use after 5MeO administration (albeit, subsequent to Ibogaine administration) in an individual with alcohol abuse has also been reported (Barsuglia et al., 2018). Here, these changes were associated with increased perfusion via PET imaging in brain regions related to substance disorders and classical psychedelic action (such as the caudate, putamen, insula, cerebellum and temporo-occipital areas). Finally, treatment of inflamed dendritic cells with 5MeO suppressed pro-inflammatory cytokines and inflammatory T cell production, and elevated anti-inflammatory cytokines, suggesting endogenous functions and clinical potential in immunomodulation (Szabo et al., 2014). Ermakova et al. (2022) has produced a recent narrative review of research with 5-MeO-DMT, where Reckweg et al. (2022) has also reviewed the pharmacology, subjective effects and therapeutic promise of the substance, including the 3 completed, and 8 ongoing clinical trials. The single published Phase 1 trial by Reckweg et al. (2021) identified significant increases after dose escalation from 2-18mg 5-MeO-DMT in peak and mystical experiences, albeit seemingly without alteration in cognition and wellbeing.

Rationale for the study

The pharmacologically analogous *N,N*-DMT (hereafter, DMT) experience has been rigorously associated with the near-death experience (Timmermann et al., 2018), as have many other classical or atypical psychedelics (Martial et al., 2019; ketamine: Corazza, 2008). Prior

analyses of the DMT experience from a field study have referenced comparability with the NDE (Chapter 3, 4) and systematically compared the qualitative content of the DMT experience and NDE (Chapter 5). However, no prior studies have looked at the relationship between the 5-MeO-DMT experience in particular and the near-death experience. The present chapter, therefore, aims to be the first to assess the convergence or divergence between 5-MeO-DMT and the near-death experience, via comparative qualitative analyses, primarily, but also psychometric analysis. Then also discussed is how this relates to the link between DMT and the NDE, and which substance may simulate the experiential features of the NDE more closely is considered. Other than Grof's (1994) report finding high comparability between LSD and a subsequent NDE, no other study has as systematically reported on persons experiencing both a classical psychedelic and near-death experience, and their personal reflections of comparability.

Methods

The following outline of methods serves as a summary of the recruitment, materials, procedure and analyses which were elaborated upon in full in the methods section relevant to this chapter under Methods & Methodology (Chapter 2).

The participant was recruited when the present author (PM) met them during a conference, and after his agreement to participate, a video-call interview was scheduled. The semi-structured interview (1 hour and 21 minutes) focused on the participant's experiences with 5-MeO-DMT and their similarities to his prior NDE.

The participant reported three experiences with 5-MeO-DMT, obtained from the venom of the Sonoran Desert Toad. The study mainly focused on the participant's "most significant" experience, which took place in a comfortable private home setting with close friends and involved a 46 mg dose.

The accounts of both the NDE, as published in the book in which it was originally documented, and the 5-MeO-DMT experiences were subjected to a thematic analysis, using an inductive approach to derive themes purely from the data. The themes were then categorised based on their presence in either or both experiences.

The participant was also asked to rate the similarity of his experiences on a given scale. The Greyson NDE Scale was also administered to provide a quantitative comparison of the experiences' phenomenological structure.

Results

Qualitative Analysis

This analysis section is divided first into similar and later into different sets of emergent themes between the experiences, where every theme is accompanied by exemplary quotes from both the NDE and 5MeO (Inclusions of '(?)' within quoted excerpts denote the partial audibility of the previous word). A diagrammatic summary of the themes extant in both states, and their overlap, is given in Figure 3. Importantly, given the unique ability of the experient to comment from a first-person perspective on both states given their undergoing of each, their personal perceptions as to similarities and differences are diffusely expressed. Finally, narrative commentary regarding the experiences is also integrated throughout (mainly in the section pertaining to *differences*, comparing given NDE excerpts to psychedelic phenomenology). In the continuation of the qualitative analysis, after the quantitative description, this commentary eventually encompasses other possible, not necessarily mutually exclusive, mechanisms of this and other near-death experiences. A particular focus of said mechanisms will bring the present chapter into a more neurophenomenological orientation, with a subsequent discussion of how the aetiology of this one case, and any others like it, may mirror the neural and computational action of psychedelics.

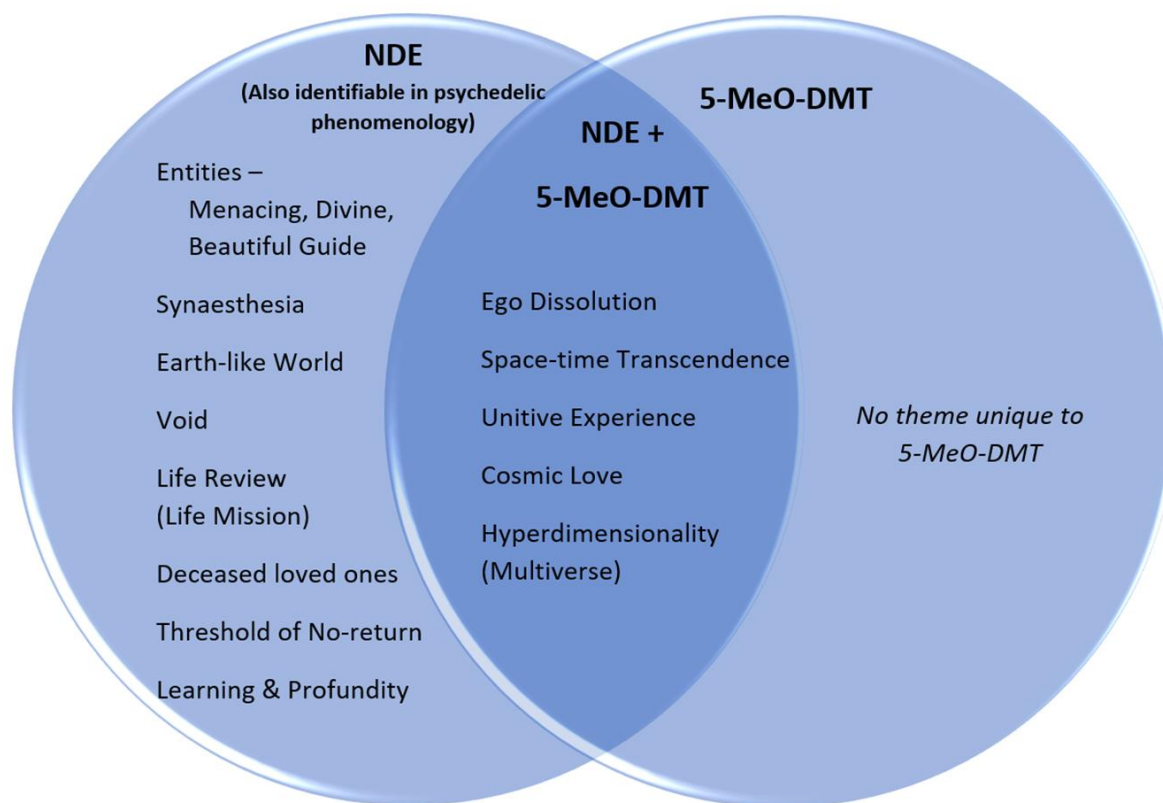


Figure 3: Themes present in either the near-death experience, or 5-MeO-DMT experience reported by *Nikoli*, or their overlap. Note: *All features of 5-MeO-DMT experience also present in NDE experience*

Similarities

Ego Dissolution

Near-death Experience – Original text (Hereafter, ‘NDE’)

Early in his NDE report, *Nikoli* recounts that his state of consciousness “was without memory or identity – like a dream... [I] was a lone point of awareness”. Later, he explains:

“I had no real centre of consciousness. I didn’t know who or what I was, or even *if* I was. I was simply...there, a singular awareness in the midst of a soupy, dark, muddy nothingness... most [other NDErs] remembered their earthly identities while away from their earthly forms... They were aware that their living relatives were still [on earth]... met friends and relatives who had died before them... Many...have reported engaging in life reviews... I

experienced none of these events... How could I...not realise that on earth I was a doctor, husband and father?... I was in a position similar to that of someone with partial but beneficial amnesia. That is, a person who has forgotten some key aspect about him or herself, but who benefits from having forgotten it... It allowed me to go deep...without having to worry about what I was leaving behind... I had come from nowhere and had no history, so I fully accepted my circumstances... And because I so completely forgot my mortal identity, I was granted full access to the true cosmic being I really am (and we all are)”

What is articulated throughout here, by such “partial but beneficial amnesia”, is virtually identical to what is referred to in the psychedelic sphere as “ego death”. That is, the annihilation, though temporary, of the sense of one’s individuated self and all of its concomitant autobiographical memories, often giving rise to an experience of being a “cosmic being”. The benefits of this are made exceptionally clear by the swathes of publications on the psychedelic-induced mystical experience, with dissolution of ego as a key dimension, being the primary predictor of therapeutic or other advantageous effect (e.g. (Griffiths et al., 2008; Haijen et al., 2018; Kettner et al., 2019; Roseman et al., 2018; 5MeO: Barsuglia et al., 2018)

5MeO Experience – Interview, including comparison (Hereafter, ‘5MeO’)

Nikoli describes that in his NDE, importantly in the context of comparing its *similarity* with the 5MeO episode, “my ego-mind was gone... [only] that inner observer, the neutral observer... the voice in your head, our little ego-mind, is not who we are and is not our consciousness... [it] is little more than a parlour trick, pay it no mind... that awareness within...is the part of us which expands tremendously when liberated from the shackles of brain and body at physical death”

Time, or Space-time Transcendence

Despite the significant similarities in terms of time transcendence in the excerpts below – there is a dissimilarity in that we see the description of ‘geometric patterns’, further qualified as transforming, evolving, and inter-locking, as well as an emphasis on the

mechanistic details of how time works, which were characteristic of his 5MeO experience, and *not* the NDE:

NDE

“I (whatever “I” was) had always been there and would always continue to be”

“...the vagaries of time in these worlds beyond...continued to hold... ponder how time lays itself out in dreams...“before” or “after” become tricky designations. You can be in one part of a dream and know what’s coming, even if you haven’t experienced it yet”

5MeO

“...the 5MeO was [more] profoundly, richly imbued with the witnessing of the interleaving of time and space and how they’re really one. And this incredible...seeing [of] the interleaving, it was almost like you could see all the various elements of spacetime and all the possible permutations, and they simply seemed to come into a locking fashion. I could watch the whole thing evolve... I could really see those geometric patterns that included what I call *counterfactuals*, in other words the possibilities that were there for a choice but that my will as a higher soul rejected. But I could still see them, I could see the possibilities... pathways of actualities”

“...you could basically see cause and effect over time and across space, but you can see them all ‘at once’. In many ways its reminiscent of... [the] life review situation [which, strictly, *Nikoli’s* NDE did not include]... It’s showing us our notion of the linear flow of time in these bodies in 4D space-time is in so many ways fabricated, it’s there as a narrative to lay down a pathway that sets a stage for us to face life’s circumstances... and for me the 5MeO gave me a glimpse of how all of that works. It was like having a microscope in my [NDE’s] *Core* realm journey and being able to look at why things appeared the way they did in my NDE, and see the mechanism of it. And the mechanism wasn’t as apparent during the NDE, just all of the lessons, all the flow, the relationships, the big picture was very clear. But if anything, the 5MeO, what it gave me in addition is that ability to witness that interleaving – like all of these very fancy tiles that would come together and self-form each other in this evolving set of patterns... it was much more micro-focused on the interleaving of time and space”

Indeed, complex fractal imagery in flux, as an apparent window into the mechanics of the universe, is in fact a classic feature of psychedelic phenomenology, especially *N,N*-DMT (Chapter 3). This said, his NDE account does report other stereotypical psychedelic visual motifs, as he and a guide “were riding along together on an intricately patterned surface, alive with indescribable and living colours – the wing of a butterfly... all of the [butterflies] together...were a river of life and colour moving through the air”

Nikoli then elaborates on this overlap in the experience of time, referring to its implications in his NDE for reincarnation:

“[The realm in the NDE] with earth-like features but also deep spiritual features, had also what I call ‘deep time’ ... [this] has to do with the much bigger ordering of progression of our souls and evolution of all consciousness, and that’s what’s occurring in that level, that *Gateway valley*... an ordering of things like reincarnation, where we improve ourselves with every incarnation, going through the life review, then planning the next set of challenges for the next incarnation”

“It was a very visual experience, the way I saw it deep in coma... it was a tapestry, and the word that comes to mind is Indra’s net. But it was this beautiful tapestry of interwoven silver and golden fibres that represented lifelines of higher soul journeys. And I saw this rich interweaving in life reviews and how that was part of the metallic garnishing at the highest points of those peaks of the weaving (?) of those life reviews. Another way it was presented to me was this absolutely glorious...flying vision, and I could see the fish down under water, that was our material realm, going under the illusion of 4D and Earth time, and then popping up out of the waters when our higher soul leaves the body, reunites with higher souls up in the air above the water, all in this much greater illumination of what’s going on, and trading of information – then *boom*, diving back into the water again for the next incarnation”

In spite of the earlier noted geometric arrays of time-space in the 5MeO, apparently lacking in the near-death experience, here even the NDE possesses clear visual representations of life-lines as ‘tapestry’-like and composed of fibres of light. Also, while any visually symbolic

imagery such as the flying-fish metaphor was absent from the 5MeO trip, archetypal symbolism such as this is characteristic of deep psychedelic journeys.

Unitive Experience

The picture he offers below of his NDE is heavily redolent of an *in utero* regressive experience, discussed directly in the below segment on Potential Mechanisms:

NDE

“...there was no difference between “me” and the...half-familiar element that surrounded me. But this...boundaryless immersion gave way to...feeling like I was...trapped in it”

Yet, he expounds on this to evoke a profound unitive experience and realisations as to the deeply intertwined nature of things – which he expresses to be a fundamental reflection of his 5MeO experience:

“Everything was distinct, yet everything was also a part of everything else, like the rich and intermingled designs on a Persian carpet [again, evoking the ‘tapestry’ not unlike the geometry of the 5MeO, or psychedelic experiences generally]... The world of time and space in which we move...is tightly and intricately meshed within these higher worlds... all worlds are part of the same overarching divine Reality. From those higher worlds one could access any time or place in our world”

5MeO

“...the 5MeO, if I had to put it on a scale, was much more aligned with the deepest aspects of the NDE in terms of the oneness... [It was] a very strong...unification, the oneness of dualism... the [5MeO] DMT certainly had the quality of bringing those dualities together, so you realise they’re just a spectrum, and the polarisations in essence didn’t exist in their own right”

He continues:

“...the Core realm [of the NDE], its oneness, the origin of all experience and the cross-over of the awareness of the universe and the universe itself – to me in all of my psychedelic experiences...the thing that most matches up with that is the 5MeO [Italics mine]”

However, *Nikoli* caveats this primary parallel with a difference in degree: “[The 5MeO was] like looking through a little peephole, as opposed to being full-bore swimming and being immersed in the Pacific ocean of being completely into that oneness experience [of the NDE]”

The following excerpt about his NDE demonstrates the concept of ‘entheogenesis’ (generating the divine within), in which one experiences an equivalence between their own consciousness and that of the divine – where ‘entheogen’ is technically another denotation for psychedelic medicines – and which *Nikoli* states is tantamount to love itself:

“Oneness with God, in that *Core* realm, my awareness, higher soul experience, was one of becoming identical with that God force, in terms of creative possibilities... conscious awareness at its root is that God force, that so many experience in an NDE as a force of pure love and pure wholeness and healing”

Cosmic Love

This love, of a more divine quality, is also extended to an encounter *Nikoli* shares with a girl, but whom he did not recognise:

NDE

“She looked at me... It was not a romantic look. It was not a look of friendship. It was...somehow beyond...all the different types of love we have down on earth. It was something higher, holding all these other kinds of love within itself”

He goes on to elaborate on his encounter with her in one realm – then with an orb, identifying it as the same girl, in yet another realm in which ‘Om’, the Source of all things, resided. The primacy of love was once again a core communication:

“Through the Orb, Om told me that there is not one universe but many – in fact, more than I could conceive – but that love lay at the centre of them all... in the larger picture love was overwhelmingly dominant, and it would ultimately be triumphant”

“If I had to boil [the message] down further, to just one word, it would (of course) be, simply: *Love*. In its purest and most powerful form, this love is...*unconditional*. This is the reality of realities, the incomprehensibly glorious truth of truths that lives and breathes at the core of everything that exists”

Nikoli expressly points out the consistency between NDEs and psychedelics in general, in the following quote, in terms of the profound love that can be felt, which is itself inextricably entwined with the sense of unity discussed above (and in the final quote). Interestingly however, one difference he alludes to here is that the NDE appears more personal in nature, illustrating the content of one’s life (such as via the review), compared to the 5MeO which may have been more transpersonal, conveying the mechanisms transcending immanent reality:

5MeO

“...one [can] witness the bigger picture [in] an NDE [vs 5MeO]; how one’s life had unfolded and feel the emotional power of one’s actions and thoughts on others, because that’s another hallmark of the life review...you experience it more from the emotional viewpoint of those around you... And that’s why the life review is so important for course-correction between lives – you’re more (?) treating the golden rule as it’s meant to be part of the rule of the universe, to treat others with love. *And the one thing NDErs see and is certainly common in psychedelic experiences, is that sense of love and connectedness, and we start to feel intimately part of each other. To me that’s an important lesson from NDEs that also comes into this world via many psychedelic experiences* [Italics added]”

We receive glimpses in this final one of themes to be expounded on below; those of hyperdimensionality, as well as experiences of light, a sense of being taught, and a communicating guide. The latter three of which don’t seem to be particularly inherent, the guide especially so, to the 5MeO trip (albeit these are certainly well-known to occur in the psychedelic space):

“...becoming one with that love force, and kind of leaving all the dualities behind, that was that *Core* realm... in that core realm I had that *Oversphere*, this higher-dimensional multiverse as a kind of teaching tool, and this sense of this brilliant light brighter than a million stars, and (?) an interpreter or a translator, and then all of this happening in an

infinite realm that was overflowing with unconditional love. Again that's something...I think people can get through... the psychedelic experience, this more (?) loving and connectedness”

Hyperdimensionality, Multiverse

In the 5-MeO, as we see in the following, we not only comparably gleam a sense of universal plurality as in the NDE, but also the shared themes of unity, as well as receiving teachings from, and about the cosmos:

NDE

“I saw the abundance of life throughout the countless universes, including some whose intelligence was advanced far beyond that of humanity. I saw there are countless higher dimensions”

5MeO

“...our minds can simultaneously experience much bigger swathes of time and space. It points to my NDE, the entire higher dimensional multiverse throughout infinite dimensional space in all of eternity and infinity, was this tiny little *Oversphere*, there as an instructive tool in the setting of pure oneness with the divine”

Also identified as consistent between the two states was the professing of ineffability.

Differences

The following excerpts for each theme are either singularly from *Nikoli's* NDE report (appearing in roughly chronological order) or the interview comparing the NDE to his 5MeO experience, and so are not directly contrasted, as above, given that they do not share counterparts in the other experience. Every theme-heading here highlights the theme's presence in the *near-death experience* and not the 5MeO, thus illustrating the ostensive differences. This being said, references to other *N,N*-DMT experiences, or other relevant

literature, are made to illuminate the sheer scope for the quoted near-death content to still be apparent in the sphere of psychedelic phenomenology (if not specifically 5MeO experiences).

Menacing Entities (only in NDE, as with all following headings)

Certain encounters with entities of a more hostile disposition were reported in his NDE – and not the 5MeO (as with all the following themes of this section):

“Grotesque animal faces bubbled up out of the muck, groaned... rhythmic chants...terrifying and weirdly familiar... The more I began to feel like a ‘me’...the more the faces...became ugly and threatening... movement around me became less visual and more tactile, as if reptilian, wormlike creatures were crowding past”

In a detailed content analysis of the *N,N*-DMT experience from an observational field study, Chapter 3 show that 8% of their 36 participants reported ‘fearsome’ beings, as well as 8% reporting reptilian entities. Participant *LR*, specifically, had a tactile-visual experience of “cosmic centipede”-like creatures “crawling around” him.

Synaesthesia

Experiences which reflected the blending of the normally separate sensory modalities were a vivid element to *Nikoli’s* NDE (also evocative of the sense of univity):

“It radiated fine filaments of white-gold light...the darkness around me began to splinter... I heard...a living sound, like the richest, most complex, most beautiful piece of music”

“...flocks of transparent orbs ...a glorious chant, came down from...the winged beings... The sound was palpable and almost material, like a rain that you can feel on your skin... Seeing and hearing were not separate... I could hear the visual beauty of the silvery bodies of those scintillating beings above, and I could see the surging, joyful perfection of what they sang... you could not look or listen to anything in this world without becoming a part of it”

This description of synaesthetic, scintillating orbs is remarkably akin to *Kastrup’s* experience in an “altered state”, (which though not explicitly divulged, is classically DMT-esque, and

reminiscent of McKenna's lectures on DMT) quoted in Kripal (2020), of a "geometric world which expresses information through Christmas ball-like globes, or 'Kandinsky scintilla'" (the abstract artist, Kandinsky, being famously synaesthetic). Synaesthesia, particularly audio-visual, has also recently been shown to be very common with psychedelics, especially with LSD (Luke et al., 2022).

Divine Being

Here we again see a very synaesthetic quality, seemingly binding visual-tactile-auditory components, but also emotional dimensions. A sense of the 'omnipresence' of a powerful being permeates this text too, as well as some 'telepathic communication':

"A divine breeze...shifting the world around me into an even higher octave, a higher vibration... I began wordlessly putting questions to this wind – and to the divine being I sensed at work behind or within it... the answer came instantly in an explosion of light, colour, love and beauty that blew through me like a crashing wave... They answered [me], but in way that bypassed language... I was able to instantly and effortlessly understand"

These features were also identified in 14% (synaesthesia), and 36% (omnipresence) of Chapter 3's DMT interviews from the aforementioned naturalistic study.

Earth-like World

The other world into which *Nikoli* became incorporated in his NDE elicited imagery of a utopian, arcadian Earth:

"Below me there was countryside. It was green, lush... It was earth...but at the same time it wasn't... I was flying, passing over trees and fields, streams and waterfalls, and...people...children, too, laughing and playing... [They] sang and danced...I'd see a dog running and jumping among them... They wore simple yet beautiful clothes...the colours...had the same kind of living warmth as the trees and flowers"

11% of Chapter 3's DMT participants described 'natural landscapes', often as 'earthly yet divinised mirror-images of earth' (Shushan, 2018). The participants *EM* and *RH*, in particular,

expressed it as “just like one of those...ancient Babylonian gardens”, “a garden of extraordinary beauty”. Furthermore, as with *Nikoli*, both related an animistic, life-infused quality to the physical environment.

Beautiful Guide

We here revisit the meeting with the girl in the NDE, also taking the form of an orb, who served to assist *Nikoli* through his journey and radiated their loving nature:

“Someone was next to me: a beautiful girl with high cheek-bones and deep blue eyes... The girl’s outfit...had the same overwhelming, super-vivid aliveness... Without using any words, she spoke to me [again, conveying telepathic communication]...and I instantly understood that it was true... The message had three parts: “You are loved and cherished, dearly, forever. You have nothing to fear. There is nothing you can do wrong”

“I had the Orb as my companion... [which] was a kind of “interpreter” between me and this extraordinary presence surrounding me... the Orb (who in fact was [the girl on the butterfly-wing]) was guiding me”

“...the “voice” of this Being was warm and...personal... It knew me deeply, and overflowed with...compassion, pathos...even irony and humour”

Paralleling this, the majority of the beings encountered in Chapter 3’s report were also of an ‘enchanted’ (56%), often ‘benevolent’ (28%) nature, and a major role served was also as a ‘guide’ (14%). The function of these entities as ‘teachers’ (25%), who were also ‘familiar’ (28%), is similarly echoed in *Nikoli*’s portrayal of his companion.

Void

An emergence into a space which seemed at once an abyssal emptiness, yet suffused with nurturing light, eventually occurred:

“...an immense void, completely dark, infinite in size, yet also infinitely comforting. Pitch black as it was, it was also brimming over with light... “Om” was the sound I remembered hearing associated with that omnipotent, omniscient and unconditionally loving God”

Again, at least 14% of Chapter 3's accounts make mention of such a 'void'-like environ as this. More saliently though, in another case series of experiences of both DMT and NDEs (Chapter 7), this "Dazzling Dark" which this void is referred to as in *Nikoli's* book description – a term originally used by Wren Lewis (1995) to describe his own NDE, in awakening from "a vast blackness that was somehow radiant, a kind of infinitely concentrated aliveness or "pure consciousness"" – is closely reminiscent to *DA's* changa experience (*N,N*-DMT mixed with MAOI-containing herbs): "everything went black, but still shimmering and vibrating... this sensation that I was in space...yet at the same time that it was the same thing as the white light".

Life Review (Life Mission), Deceased loved ones

An evaluation of one's life, as in *Nikoli's* NDE, is here connected to the moment of meeting with already passed on loved ones, via the accentuation of the importance of relationship – themes which he feels are not as intrinsic to psychedelics:

"...encountering souls of departed loved ones or profound life reviews where you realise the life review's really not about you but about your inter-relationships with others – those are the pieces that in general seem to be shallow in psychedelic drug experiences, especially the parts that line up more with one's life mission"

Threshold of No-return

Nikoli identified what he "would call that 'threshold'" with what he "saw between the *Gateway* valley that had a tremendous number of Earth-like features", also qualifying that that would be where a life review would happen, reunited with souls of departed loves"

Regarding these former two themes (Life review, Deceased), associated with the latter (Threshold), the conjecture as to their being shallow with psychedelics has been quantitatively supported. For instance Greyson (2014) evidenced that the features of seeing the deceased, having a life review, and coming to a border were characteristic of NDEs when compared to a measure of mystical experience. This is mirrored in chapter 5's finding of these same three items to score the lowest when the NDE scale was applied to DMT

experiencers. This, however, does not mean they are absent, as for example chapter 5's results also include the review and encountering the dead in 6% of DMT experiences each – interestingly though, excluding the threshold, suggesting it as especially unique symbol to the near-death experience, given its obvious symbolic denotation of the irreversibility of death. This said, again in chapter 7's series of DMT & NDE experiences, SR reports in his changa experience, a “metal gate, with gaps” which he was prevented from going through by a feminine entity, as if signalling “you're not ready yet”.

Learning, Profundity

As above, in the quote below *Nikoli* again asserts a possible distinction between NDEs delivering more personal insights, versus more transpersonal content being the domain of psychedelics. Most saliently though, *he* here alludes to the real possibility that it is the artefact of their having limited psychedelic exposure which may be the reason for opining in this way (and by extension, about other differences):

“I gave up drinking in '91, I'm a recovering alcoholic, the fact I was adopted so I spent a lot of my life thinking at some deep level, not consciously, that I wasn't worthy of life because my birth mother left me behind when I was 11 days old. So those deep knowings of oneness with the universe, of why that addiction would be there in the first place, all that stuff was very apparent through the wisdom of the NDE [compared to the 5MeO]... the 5MeO after my NDE...definitely taught me some interesting factors about the nature of reality, but whether they offered me any of the really deep knowledge of my personal journey, my higher soul's work with this universe, to me it's not so apparent. *Maybe if I had a more dedicated programme and I continued using them, then that would be one thing* [Italics mine]”

This idea of making these distinctions, such as revelations into one's personal tribulations, being related to limited awareness of psychedelics is especially born out in his seemingly not being cognizant of psychedelics' therapeutic effectivity in trauma and addiction, specifically research suggesting this as being not only owing to neurobiological interactions but via the subjective experience, such as insights and life reviews (e.g. Davis et al., 2021; Schenberg et al., 2017; Wolff et al., 2019)

Also identified as inconsistent between the experiences was the special emphasis on hyper-reality in the NDE – though again this is an almost ubiquitous appraisal of the DMT space.

Descriptive Quantitative Analysis

In order to quantify the comparability of the participant's subjective appraisal of the two states, *Nikoli's* response to the following two questions suggested *low* similarity, underlining the many qualitative differences explored above – yet still in spite of the also profound convergences in several domains:

- i) How similar was your 5MeO-DMT and near-death experience? (1 = completely different; 10 = identical)

Answer: 2

- ii) What is the extent of your belief (if any) in the production/occasioning of your NDE being due to endogenous psychedelic-like brain chemicals, such as 5MeO-DMT (1 = absolutely impossible; 10 = absolutely definite)

Answer: 2

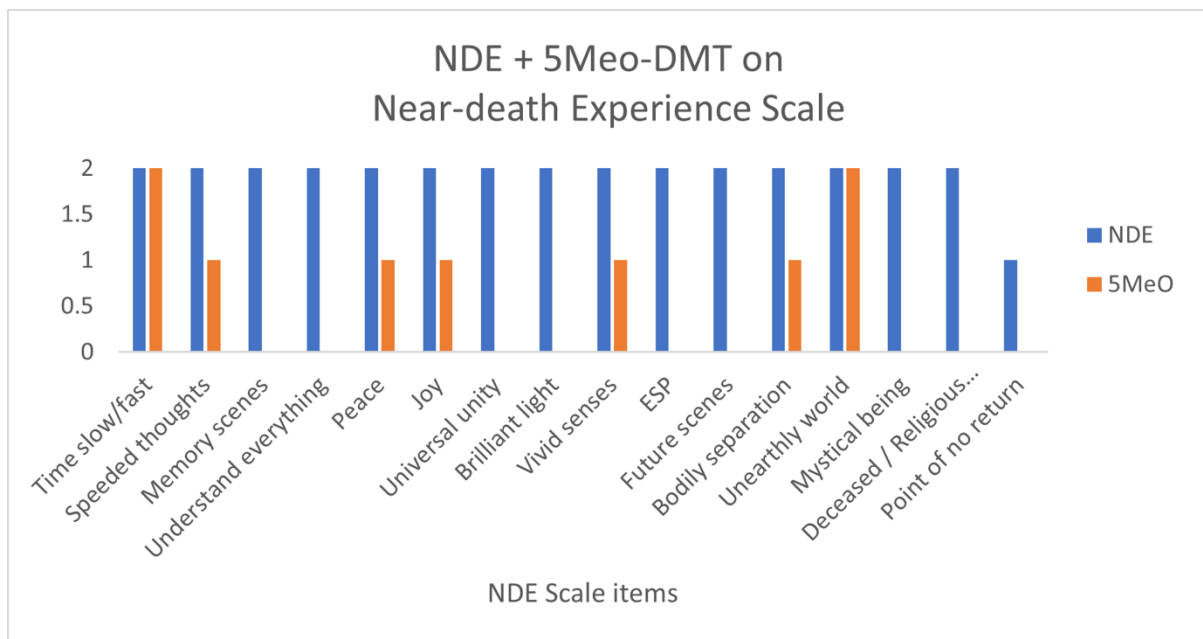


Figure 4: Scores from the Near-death Experience Scale compared between the 5MeO-DMT and Near-death Experience

From Figure 4 above, it can be seen that the NDE was rated highest for virtually all scale-items (resulting in a total of 31/32), excluding the ‘threshold of no return’ which was only present to a certain degree. The psychedelic experience from the 5MeO-DMT, however, was rated substantially lower on almost all features (scoring only 9/32 in total). The emergence into some other realm and distortion in time were scored maximally, with separating from the body and the only other clearly mystical feature of peace/joy being also partially present (along with enhancements in thoughts and senses). In short, it might be concluded, albeit from this singular case study, that the 5MeO state is only a poor model for the NDE, simulating it in only a small cluster of mostly shallow ways.

These psychometric results align somewhat with the wealth of interview data examined above, such as the elaborate descriptions of the transcendence of time taking place within a space entirely distinct from waking reality, and with an emotional valence of apparently total positivity – transpiring in both of the two states. However, from the qualitative analyses it should be readily observable that the *Nikoli’s* 5MeO experience did, at least in part, also consist of a sense of receiving insights, and indications of the experient’s personal

life trajectories such as the ‘counterfactuals’ mentioned – but especially, the lack of endorsement of universal unity is disjointed with the qualitative report. While not undermining the endorsements of the experient, *per se*, these discontinuities could suggest the superiority of such in-depth semi-structured interviews in extracting richer, and thus more complete (and possibly more accurate) experiential data. Whereas, such quantitative scales may be inherently limited in allowing only fixed-answer responses with possibly ambiguous labels and descriptors, in this case possibly over-estimating the differences between two experiences. This, perhaps, is indicative of the strength of mixed methods results for necessary, mutual complementation.

This being so, there are various congruences between these quantitative and qualitative results. These include the absence in both reports of the light, and ESP – demonstrating, in this way, the experiences can again be said to be significantly convergent (by feature absence). However, evidence of other beings, or religious/deceased spirits is given for the near-death experience, but not the 5MeO experience – in this way, demonstrating key divergences which may be the most robust, and after possible discrepancies in the quantitative scoring, may represent the most important distinguishing features of the two states. When relating such findings to the literature, the appearance of brilliant light is typically strongly associated with the 5MeO experience (Millière et al., 2018), though not found (during scoring or interview) in the present study. The lack of other presences in the 5MeO experience, however, is particularly well substantiated by already extant data (Millière et al., 2018), with the phenomenology of this psychedelic characteristically being of a non-dual and ‘contentless’ nature – compared to such encounters classically transpiring during NDEs, with meetings with the dead being one of the commonest NDE features (Charland-Verville et al., 2014).

Qualitative analysis, continued: Potential Mechanisms

The below analysis centres around a leveraging of many of the quotes, either from the NDE account or later interview, to indicate what they may mean for understanding possible mechanisms for where parts of *Nikoli*'s own, or other, NDEs arise from.

Psychedelics, Lucid Dreaming, and Mind-manifestation

While the focus of the present study is on evaluating the 5MeO drug experience, particularly, as a useful model for NDEs, the meaning of the term ‘psychedelic’ in fact means ‘manifesting of the mind’. Where sensory experience is determined by psychical content, as well as the dissolving of boundaries between one’s outer world and inner experience, the relevance of dreaming for NDEs arises. On two occasions already *Nikoli* has compared his NDE to a dream – however, especially pertinent is *lucid* dreaming, wherein the dreamer is not only cognizant he is dreaming, but when practiced may manipulate his mind-constructed environs. *Nikoli* himself is aware of the connection between this phenomenon and NDEs – “...those who’ve become good at lucid dreaming, that’s a little more the kind of engagement you get with the universe in an NDE” – yet below, he doesn’t himself comment on how his own NDE reports are compellingly resounding of lucid dream-like behaviour, and could suggest shared mechanisms between the two. Importantly, the endogenous psychedelic model is not *per se* incompatible with a lucid-dream view, as indeed, serotonergic psychedelics are known to simulate lucid dream content (Sanz et al., 2018):

“I felt a sense of sadness unlike any I’d ever known. Emotions are different up there...deeper, more spacious – they’re not just inside but outside as well. Imagine that every time your mood changed here on earth, the weather changed instantly... That your tears would bring on a torrential downpour, and your joy would make the clouds instantly disappear... how much more vast and consequential changes of mood feel like up there, how strangely and powerfully what we think of as “inside” and “outside” don’t really exist at all. So it was that I, heartbroken, now sank into...an actual sinking”

“I had to learn to navigate it on my own, which I did by acknowledging those musical melodies that could conjure up various portals between levels”

“I actually had some control over my course...I was no longer trapped in this lower world. *With concerted effort, I could move back up to the higher planes...* I found myself wishing for the *Spinning Melody* to return... the gorgeous music, and the spinning ball of light emitting it, blossomed into my awareness... and I began to rise... *to know and be able to think of something is all one needs in order to move toward it...* [Italics mine] I accomplished this

back-and-forth movement from the...*Earthworm's Eye-view*...to the *Gateway* and [then] to...the *Core* any number of times”

Interestingly, the ‘spinning melody’, referring to a highly synaesthetic orchestration of both sound and light, which *Nikoli* concentrated on to ‘move’ between realms, may also be relevantly compared to findings of ‘up-lifting’, healing and novel music emerging in the lucid dreams of those with depression (Sackwild & Stumbrys, 2021).

Perinatal Regression

The reactivation of pre-, post-natal or *in utero* memories has been developed as a framework for certain psychedelic phenomenology by Grof (e.g. 1985, 2007) – the ‘basic perinatal matrices’ 1-4 – as well as being one of the original theoretical models for NDE production. The several excerpts below are not only exceptionally uncanny in terms of their evocation of the experience from the perspective of a foetus, but are explicitly articulated using such perinatal terminology – yet such a possible explanation is not at all alluded to. In this way, the endogenous psychedelic model is not mutually exclusive with a perinatal regressive explainer of NDEs, as they themselves can be conducive to such regressions:

In his near-death experience, *Nikoli* first found himself in an “underworld”, which he later characterises as the “*Earthworm's Eye-view*”, composed of “visible darkness... Transparent... blurry, claustrophobic, suffocating”. A “deep, rhythmic pounding” also accompanied him, which was “*like a heart-beat... as if a giant, subterranean blacksmith is pounding an anvil*”. This space was primitive in nature, “*as if I had regressed back to...the very beginnings of life*”. He also recalls “conceptualising that I might or might not survive”. Eventually he witnesses something “*like roots, and a little like blood-vessels in a vast, muddy womb. Glowing a dark, dirty red... in a timeless red-brown sea*” [Italics added].

After his synaesthetic-like scene of emerging into light which dispelled the dark (accompanied by otherworldly music), *Nikoli* recounts a classic NDE sequence which largely inspired the perinatal model of NDEs, with the sound and transportation being especially DMT-esque: “An opening. I was no longer looking at the slowly spinning light at all, but through it... I began to move up. Fast. There was a whooshing sound, and in a flash I went

through the opening and found myself in a completely new world. The strangest, and most beautiful world I'd ever seen. Brilliant, vibrant, ecstatic, stunning... *I felt like I was being born. Not reborn, or born again. Just... born*" [Italics added].

After elucidating his *Core* experience, encompassing a darkness suffused with light, he continues that: "My situation was...*akin to that of a foetus in a womb... with the silent partner of a placenta, which nourishes it and mediates its relationship to the everywhere present, yet...invisible mother* [Italics added]. In this case, the "mother" was God, the Creator, the Source... This Being was so close, there seemed to be no difference at all between God and myself"

Relatedly, the following two excerpts illustrate what could be interpreted as a *shamanic rebirth* (M. Winkelman, 2002, 2013), or the *Deus Ex Machina* (an ancient motif displaying divine salvation or supernatural rescue):

In this initial primitive world, *Nikoli* becomes aware of a smell, "like faeces, a little like blood, and a little like vomit... of biological death", then reports that suddenly something emerges from the dark, and that he would "never be able to...come anywhere close to describing how beautiful [this entity] was". Incidentally, St John (2015) expands on contemporary and aboriginal Australian experiences of DMT as often plunging the experiencer in such grotesque, blood/vomit/skeleton permeated landscapes, in such a context as the 'shamanic ordeal'.

The following rebirth imagery, especially, is also entangled with the above lucid-dream model, where deliberate attention or intention may drive a significant shift in (seemingly) external experience:

"I would fall and tumble out of that sanctum sanctorum, that *Core* realm of pure oneness with the divine (?) back down to the *Earthworm's Eye-view*, and it was only by remembering the musical notes of the *Melody* that I could then conjure up the portals that...enabled me to re-ascend...into that *Gateway* valley... and then witnessing those angelic choirs above...served as a portal to higher levels"

Cortical Disinhibition and the Anarchic Brain

The below excerpts from the subject exemplify that their view on the NDE's potential induction via such endogenous chemicals is not purely predicated on the similarities of their phenomenology, but opinions based on its feasibility when considering the neuroscience, leading to discussions of philosophy of mind. Finally, a more nuanced, novel neural approach is taken in the analysis, but with certain caveats which themselves then resurface the challenges of the origin of consciousness.

“[The neocortex] is a 6 layered system, and even disrupting the superficial two layers is enough to destroy the functional integrity of the system because the superficial layers are very important at the integration across the neocortex. The deeper [subcortical] structures are more about relationships between that part of the neocortex, the thalamus and [themselves]”

This former statement points to the inherent lateral interwiring within the columnar architecture of the neocortex, where significant damage to the surface laminae interrupts the functioning of the lower ones. The latter comment implies that if indeed these neocortical laminae are more fully disrupted, this itself prevents the full functioning of the subcortical areas (e.g. thalamus, basal ganglia) too, given their reliance on the relationship with the neocortex. These sentiments are repeated in an appendix in *Nikoli's* original documentation of his NDE. If this is accurate, which may be signified by the excessive meningeal enhancement (inflammation) and sulci obscuration by purulent (puss-filled) CSF, as well as pin-point and unresponsive pupils suggesting brainstem damage (Khanna et al., 2018), then this presents a challenge to any sufficient neural explanatory framework.

“The important thing to keep in mind here is as a materialist neurosurgeon like I was (?) before my coma, you have a certain set of assumptions [which]... can be your undoing... as if the brain creates consciousness. Whereas if you simply move away from that one step and say, well the brain's not creating consciousness but it is serving as a filter, it is limiting primordial consciousness and allowing it to express in a here and a now and sense of self... consciousness is something that exists, and what we're looking at is mechanisms to detach it from the here and now, and what I would say is a much more fundamental way to detach your consciousness from the here and now has to do with manipulations at that *lower brainstem level*... And when we do things up in the neocortex say with serotonin 2A interactive drugs, then we're altering the filter function, and it's been known for ages that

altering the filter can alter the residual ‘what we experience as consciousness’. But in many ways we’re talking about traversing the veil and getting to consciousness on the other side of that filtering (?) mechanism [i.e. the brain]”

By such a contemplation, the participant appears to be volunteering his own non-materialist perspective. That is, such damage to his neocortex allowed a total detachment of his consciousness to experience greatly expanded awareness – in a comparable way to agonism at the serotonin (5HT) 2A cortical receptors also resulting in a similar reversal of the filtration of mind – and where in fact an interruption at the more basic brainstem level instead represents (somehow) a yet even more efficient mode of achieving this (presumably where total brainstem disruption, i.e. brain death, is the most fundamental liberation). This brings up a diametric opposition of ontologies, yet predicated on the same neuroscientific matter of neural mechanisms i.e. higher cortical or 5HT-2A mediated disinhibition of mental content. That is, *Nikoli’s* own view being equivalent to a transcendentalist ‘transmission’ theory of brain in which consciousness is filtered from a non-material source, and the alternative being the conventional model in which consciousness is filtered, while still intrinsically brain-generated.

In this frame, what could amount to a debate on the ‘hard problem’ of consciousness – i.e. from *where* does consciousness originate, either the brain itself or another undefined trans-material source – would arise, if not for a slightly more nuanced appraisal of the neural mechanisms. Generally, any disruption of the filtering mechanisms leads to, and any resultant ‘heightened consciousness’ is derivative from, the *disinhibition* of deeper, normally constrained neural networks. More specifically, the ‘anarchic brain’ or REBUS (Relaxed Beliefs under Psychedelics) model (Carhart-Harris & Friston, 2019) attempts to unify the entropic brain theory based on psychedelic neuroscience (Carhart-Harris et al., 2014; 2018) and the free energy principle based on the brain as a predictive processor. The model clarifies that when psychedelics agonise the layer 5 pyramidal neurons’ 5HT-2A receptors, the brain undergoes a disintegration of the Default Mode Network (DMN), which is itself a higher-cortical connector hub, thus leading to a release of lower, otherwise inhibited circuits, as well as a desegregation of otherwise disconnected non-local networks. Computationally, such higher-level cortical tissues encode top-down ‘priors’, representing prior knowledge of the world as learnt through developmental history and generating the

brain's internal model of the environment. These priors serve to inhibit bottom-up, incoming sensory data, in the case where the generative model is consistent with such extrinsic information. Where these sources are incongruent, the bottom-up data represent 'errors' which are not inhibited and serve to update the internal model. Under 5HT-2A agonism, like by psychedelics, however, the respective weighting between these top-down and bottom-up signals is fundamentally disrupted, and the brain is less capable of predicting, or explaining the cause of one's immediate experience, and so the error signals, tantamount to raw sensory information, floods one's consciousness. As such, Huxley's 'reducing valve' of the nervous system is reversed, and 'mind at large' is liberated.

In this way, if the certain manifest overlaps between the NDE and the 5MeO or other psychedelic experiences do not directly argue for the release of such neurochemicals, then alternative triggers which converge on the same ultimate neural mechanism is still entirely possible. One novel conclusion of this study, then, points to the very unique aetiology of conditions such as meningoencephalitis of the higher laminae of the neocortex, possibly constituting such a convergent mechanism. That is, in effect, it may simulate similar downstream neural activity as that underpinning classical serotonergic psychedelics' neural mechanism of action. As such, top-down cortical disinhibition of major high-level cortical nodes – in the psychedelic instance triggered by 5HT-2A agonism of layer 5 pyramidal cells, and in the meningoencephalitis case triggered by damage to neocortical laminae including such a layer – would lead to the release of bottom-up intrinsic cortical/subcortical information, in turn 'passing up' the neural hierarchy, and finally converging on massive expansion of conscious experience. Alternatively expressed, top-layer impairments in the cortical hierarchy interrupts their capacity to construct and downwardly transmit accurate predictions, thus amounting to failures in predicting and so suppressing the error signals (sensory input). This then enables the errors' propagation up the hierarchy unrestrainedly, and elevate sensitivity to extrinsic or intrinsic informational input. The cortex's natural response here to minimise the errors via updating of the generative world-model becomes futile, instead leading to a more entropic neural and fluid phenomenal state – precisely like the worlds inhabited by those after ingesting psychedelic substances. (Also, in reference to *Nikoli's* preference for brainstem manipulation for such consciousness expansion,

theoretically, stimulation at such deeper sites such as the brainstem could mimic any intrinsic activity release from otherwise inhibitive higher cortices).

This type of model where impairment to more evolutionarily recent cortices results in an (initially counter-intuitive) elevation in conscious experience, echoes similar reports in the literature, such as the finding that those with traumatic brain injury with lesions specific to the middle-superior temporal, but especially the dorsolateral prefrontal cortex, scored significantly higher versus controls on mysticism measures, signifying the causal role of executive regions downregulating mystical experience (Cristofori et al., 2016). Additionally, resection during brain tumour surgery of the inferior posterior parietal lobes (constituting the lateral node of the DMN), including the inferior parietal lobule (left hemisphere) and angular gyrus (right hemisphere) increased the reporting of self-transcendence, involving constructs such as unity and space and timelessness (Urgesi et al., 2010). This is consistent too with the widely popularised case of Bolte-Taylor's 'stroke of insight', where an infarction disabling much of her left hemisphere (normally exerting a dominant inhibitory effect on the right) lead to a profound mystical experience of selfless unity (Bolte-Taylor, 2009). Similarly, the many reports of acquired savant syndrome, wherein after traumatic brain injury or dementias (e.g. fronto-temporal) some individuals present with especially developed cognitive or artistic capacities, are likely also relatable to the disinhibition of lower-level structures due to inactivation of higher, inhibitive zones such as the prefrontal cortex (Takahata & Kato, 2008). This itself is equally compatible with the predictive coding frame, where such disinhibition is equatable to disrupted high-level predictions leading to increased sensory data/error (Gallimore, *personal communication*, March 1st 2022).

However, this proposition as applied to the case of *Nikoli's* NDE is not without its caveats, such as the possibility of at least some component of the neocortex still being necessary for the reception of any released intrinsic activity – as well as that pointed out by *Nikoli* that even superficial damage to the top-most neocortical laminae may undermine their entire functional integrity. As the neocortical damage in this case appears very diffuse and non-selective, there may not be the necessary preservation of minimal neocortical function for the construction, and experience, of any type of inner world (Gallimore, *personal communication*, March 1st 2022). This possibility, compounded by the fact that any deeper, subcortical zones, despite their preservation, are not in themselves computationally

sufficient to account for the patently exceedingly elaborate phenomenology of the present NDE, makes for a notable challenge for a fully explanatory, neurally mechanistic model. While other authors (Greyson, 2021; Khanna et al., 2018) have argued that the damning medical data, such as the *structural* CT scan report, is sufficient to claim the inadequacy of the brain to drive this particular NDE – the glaring lack of any *functional* imaging tools (EEG/PET/fMRI) employed during *Nikoli's* hospital stay precludes the full legitimacy of this statement (Michael, *in press*).

Other neural mechanisms

Further to the putative neural contributions to the near-death experience, not noted in previous reports on this experient's NDE (e.g. Khanna et al., 2018), is the possible role of the seizure with which the patient first presented upon entry into the emergency room. All of complex partial, absence, and the generalised from demonstrated by the present case, have been shown by Danielson et al. (2011) to co-occur with significant reductions in the activity and functioning of the default mode network (DMN), via the discharges resulting in inhibition of arousal-promoting nuclei otherwise helping to drive the DMN. The disintegration of the DMN and concomitant network desegregation under the influence of psychedelics, as discussed above, are considered to be the primary functional connectivity changes undergirding the drugs' psychoactive profile, with initial evidence for this in the form of reduced oxygen-perfusion in the DMN under psilocybin (Carhart-Harris et al., 2012). As such, in line with the present analysis' argument for the substantial phenomenological resonances between the NDE and 5MeO, and other psychedelic, states – although no direct evidence has been provided for similar alterations on DMN activity during near-death, it is highly plausible due to said resonances. The generalised seizure, then, presented by *Nikoli* at the very onset of his meningioencephalitic illness, may feasibly be yet another key neurobiological correlate for his subsequently reported NDE. That such epileptic activity may be tightly associated with NDE-like states is suggested by overlap between ictal and NDE (Blackmore et al, 1998; Greyson et al., 2014; Hoepner et al., 2013) or other mystical phenomenology (Coles, 2013; King et al., 2019) and the physiology of seizure, especially temporal, activity being linked to reporting NDEs (Britton & Bootzin, 2004) or other florid dream-like states (Carhart-Harris, 2007).

This being said, his NDE has been 'placed' instead during hospital days 1-5 (when GCS scores indicated deep coma, ranging from 6-7), on account of accurately reporting, from an out-of-body perspective, bedside visits from non-family members (Khanna et al., 2018). However, this is not entirely logical, as this perceptual report can only temporally situate the out-of-body percepts of his physical surroundings, which may be entirely dislocated from his wider NDE – indeed, this is suggested by his not reporting an out-of-body experience (OBE) at the onset of his NDE which is otherwise characteristic of most NDEs (Charland-Verville et al., 2014). Irrespective, the reporting in itself of such anomalous phenomena as these reputedly veridical OBEs as part of his NDE account – which also includes an alleged 'peak in Darien' experience in which he encountered a presence he only subsequently identified as an unknown deceased family member – gestures at parapsychological events not accommodated by the present neural models, but also at the need for further, rigorous investigations of this, and similar, features (beyond the scope of the present study).

Additionally, the emphases made by *Nikoli* on so-called 'counterfactuals' occurring mainly in his NDE but also the 5MeO trip, in which he reported witnessing a vast tapestry representing alternative life trajectories, including future pathways such as those predicable only on different past decisions, may also have some neurobiological light shed on it. Van Hoeck et al. (2013) has reported that compared to episodic memory of negative past and imagining of positive future events, counterfactual cognition (constructing different, better future outcomes from past events) was associated with more extensive activation of the medial temporal lobe (e.g. core memory circuits), medial prefrontal cortex (e.g. theory of mind), as well as additional recruitment of bilateral inferior parietal lobes which includes the angular gyrus (e.g. body schema, attention, declarative memory, language) – the latter two regions, incidentally, directly overlapping with nodes of the DMN, and the former being intrinsically associated. The precise mechanisms for *Nikoli's* subjective visualisation of said counterfactuals, and in the highly intricate form described, cannot be readily accounted for. However, this neuroimaging data, compounded by the quintessential effects of psychedelics being to 'reveal the mind', can provide a working framework. An analogy to this may be the kaleidoscopic hallucinatory displays being a product of occipital disinhibition, in which you are "basically seeing your own visual architecture" (Cowan, 2013).

Discussion

Core comparability residing in mystical experience

Taken together, very many similarities can be observed between the participant's original, naturally-occurring NDE and the psychoactive experience elicited by 5MeO-DMT, such as ego dissolution, unitive experience, cosmic love, ineffability – and most evidentially from the above analysis, transcendence of time and space, especially the experience of 'counterfactuals' (linear time transforming into an expanded view of alternate life trajectories), by which hyperdimensionality may also be encompassed. This suggests the fundamental way by which the NDE is comparable to 5MeO is within the domains of the mystical experience, where all the above constitute 5 of the categorised dimensions of this experience (cosmic love being resonant with the 'bliss' factor; MacLean et al., 2012).

Similarly, although very many themes of *Nikoli's* NDE were identified as being discordant with his own 5MeO experience, all of them are either still characteristic of, or sufficiently common in, other psychedelic experiences, especially *N,N*-DMT (and some of which also reported with 5MeO, including the void, or profound learning) – that is, other beings, either divine or menacing, other, often earth-resembling, worlds, voids, synaesthesia, life reviews, deceased loved ones, thresholds and learning.

Elaboration on comments by Harris (2014)

Considering this, Harris (2014) – prior to *Nikoli's* experimentation with 5-MeO-DMT – represents a previous comparison of the subjects' NDE with an analogous DMT state. He details a similar argument that the imagery in his original NDE report, contrary to *Nikoli's* protestation of it "not being in the same ballpark" of a psychedelic experience, is actually "the stitching on the same ball" and perfectly reproducible by an *N,N*-DMT trip. Although, to be more nuanced, as implied by the present analysis, the more dualistic (*I-It*) experiences surrounding *Nikoli's Gateway* realm is more inducible via such DMT trips. The special evocation of the NDE by his 5MeO experience, on the other hand, i.e. the profound mystical and non-dual (*I-thou*) dimensions, especially in the *Core* realm, may imply that endogenous 5MeO could be contributory specifically to these subjective motifs – conjuring a model in which different endogenous chemicals differentially contribute to separate phenomenological domains.

Harris (2014) also makes the important observations that though *Nikoli* states in his book that loss of cortical activity is “clear from global critical involvement documented by CT scans”, activity can only be appropriately determined from functional versus structural imaging (Michael, 2021a). However, he also cites that 50-70% of cortical activity remains in comatose patients – where although half of normative cortical activity may remain, it is crucially the processes of network co-activation, complexity and information integration which is largely considered pivotal for the sustaining of consciousness (e.g. Seth et al., 2011), which may well have been insufficiently maintained given the encephalitic damage. Despite this, such functional data is not available, and in light of the hypotheses speculated in the *Anarchic Brain* segment above, reduction of high-level networks may indeed elevate such lower hierarchical entropy and integration, in turn mediating high intensity conscious experience, as seen under psychedelics (e.g. Carhart-Harris & Friston, 2019). Also, in countering *Nikoli’s* argument that the cortex is what is assumed to be requisite for consciousness and yet his was disabled during his NDE, Harris reminds us that “no one thinks that consciousness is just a matter of the cortex” – however, the ‘content’ of consciousness, such as the baroque, multisensorial and narrativized NDE *Nikoli* reports, is considered to rest upon cortical integrity (while ‘wakefulness’ itself is mediated by brainstem nuclei; e.g. Martial et al., 2020).

Returning to an agreement with Harris (2014)’s appraisal, his point that endogenous DMT requires only a few minutes of brain activity to engender an “eternal experience” is salient, given the intense temporal distortions elicited by DMT/its analogues. Similarly highly pertinent is that the fact that anybody remembers their NDE at all necessarily suggests that neural structures required for short-term memory formation and long-term consolidation, and presumably the structures active during retrieval which mirror the original structures active at encoding, must have been at least sufficiently functional during the critical period, for the subsequent re-recruitment of those same memory traces during recall. This presents a significant challenge to any notion of non-local consciousness during the NDE, given the problem of lack of encoding substrates despite eventual retrieval, finally supporting the ‘shut down’ or ‘reboot’ timing for the experience. This being said, if one does theoretically endorse any veridicality to the NDE’s ontology, a (thus far unknown) bodily independent memory capacity could still account for the recall upon recovery – though, again, this

problematically betrays the perennial issue of dualistic interaction.

Proposed mechanistic models

Even while accepting these striking similarities, this is not in itself immediately justifying of a model in which the dying brain produces endogenous psychedelics (which 5-MeO-DMT and *N,N*-DMT both are) thus accounting for the phenomenological overlay. As discussed above, the phenomenology is also remarkably echoing of lucid dreams, as well as perinatal regression (where the latter mirrors only certain features, such as the primitivity, boundarylessness and rebirth). All the psychedelic, dream and perinatal perspectives however, are not mutually exclusive, given psychedelics and lucid dreams' ability to partially reproduce each other, and psychedelics' induction of perinatal experience.

Importantly, however, while the initial triggers may all be independent, the end-point neural mechanisms may be very similar between each of them. This is especially so concerning the above, already elaborated, concept that endo-psychedelics need not be implicated in the near-death state, or in this case a meningioencephalitis induced coma, as they may both converge on the down-stream mechanism of a release of suppressed, intrinsic bottom-up information. Caveats, though, remain that a sufficiently intact neocortex may still be requisite to compute the released data, as well as to preserve the function of deep-brain subcortical zones.

Psychedelic experiential repertoire

In spite of these evident phenomenological resonances, the participant was insistent that his NDE and psychedelic experiences were insufficiently similar to warrant any explanation by endo-psychedelic contribution, as also reflected in his very low quantitative appraisal of 2/10 for both similarity and likely psychedelic induction. This opinion may be in part owing to the lack of adequate personal experience of, as well as overall familiarity with, psychedelics (*Nikoli* himself admitting only one other less significant experience with *N,N*-DMT, and some lower-dose LSD and Mescaline trips in his adolescence). Thus, he may be less equipped to draw the extant and extensive parallels, in the same way the subculture of the psychedelic community *is* otherwise able, in having developed the nuanced vocabulary to parse these transcendent states.

Implications for consciousness

Ultimately, despite this novel neural model of the neocortical damage simulating the expanded consciousness resultant upon psychedelic action, this is not by necessity incongruent with a transcendentalist interpretation of this striking near-death experience. That is, a 'theoneurological' conception (R. Strassman, 2014) consistent with the transmission theory of the brain and consciousness, may simply be complimented by another, more nuanced neurobiological perspective. While this proposed model does constrain the need to invoke some trans-material source of consciousness, the 'hard problem' still remains, given the apparent gap between the physical substrate, even computational mechanisms, of the brain and subjective awareness. This said, the free energy principle does attempt to bridge this (Solms, 2021), for instance via predictive processing of interoceptive input (Solms & Friston, 2018), as do many other theories of consciousness applied to psychedelic action such as cortico-thalamo-cortical loops (Preller et al., 2019) and cortico-claustrum connectivity (F. S. Barrett et al., 2020; Stiefel et al., 2014). However, again, this is critiqued as helping to explain only the contents (the 'easy problem') versus the appearance of phenomenal consciousness (Yaden et al., 2021).

Limitations

Finally, limitations of the present study encompass the aforementioned scant limited prior use of psychedelic agents by the participant, and thus possibly lacking the requisite conceptual repertoire to recognise the overlap between his own, and indeed others', NDE and 5MeO/psychedelic experiences and as such the former's inducibility by the latter. Importantly, this may draw attention to this process occurring whenever unexperienced persons undermine the possibility of endogenous psychoactive chemicals to drive near-death or similar spontaneous states, which is a tendency of many authors or commentators in the field of near-death studies or its community. Future studies may thus benefit from recruiting those with a greater experiential repertoire. In spite of this, the interpretations *Nikoli* gives in understating this possibility should be recognised, where he emphasises the shallowness of his 5MeO trip compared to the profundity of his NDE. Another limitation, not unrelatedly, may be any ideological biases which *Nikoli* may hold which may lead him to

such a conclusion. This is alluded to in many of his above statements, wherein, as a direct transformation in metaphysical beliefs after his NDE (as also identified after psychedelic experiences, Nayak et al, 2022; Timmermann et al., 2021), he eventually rejects mechanistic neuroscience in favour of a transcendentalist/post-physicalist paradigm, hence driving a potential prejudice against a reductive account of his NDE, as implied, yet not entirely mandated, by a neuropharmacological model. These limitations are also, partly, a product of employing a single case study to delineate the psychedelic-NDE relationship, which similarly inherently limits the range of qualitative content generated, and as such further studies are warranted of either a between-subjects comparison of the different experience types chapter 5, or within-subjects amongst those reporting both (as herein; and chapter 7). The scant population, however, in this latter camp was one reason for the single case study currently presented.

Chapter VII:

Smokable ‘Vine of the Dead’: Two Case Studies of Experiencers of Both Changa and Near-death Experiences

Introduction

Changa

“Changa” is a blend of *N,N*-DMT crystal freebase added to a plant, often *Banisteriopsis caapi* or *Peganum harmala*, which contains monoamine-oxidase inhibitors (MAOIs) such as the harmala alkaloids (with possible further herbal admixtures). Infusing extracts of the DMT and harmala alkaloids into plant matter is also possible. The mix is reported to increase the duration or intensity of the DMT experience, and for this reason is sometimes referred to as an ayahuasca analogue or “smokable ayahuasca” – the Amazonian shamanic brew constituting DMT-containing and MOAI-containing plants. Ayahuasca is Quechua for ‘vine of the dead’. The study by Gaia (2016, 2017) appears to be the only formal research into the phenomenology of the experiences resultant from smoking changa, yet that of DMT alone has been studied rather extensively (Chapters 3-5; Cott & Rock, 2008; Davis et al., 2020; Strassman, 2001). As such, the experiential differences between changa and DMT, or indeed ayahuasca, have also not been well delineated, but are addressed to some degree by Gaia (2016).

The term ‘smokable ayahuasca’ seems to be justified, not only due to the chemical link, as many of Gaia’s participants reported undeniable similarities in the visionary experience, and akin to “the peak of an ayahuasca session” (p. 37). In Australia, “Aussiewaska” is also a colloquialism employed when the DMT is sourced from local *Acacias*. Online communities such as *DMTNexus* list multitudinous changa recipes, including one named “Ayahuasca android”. Changa was available over the counter in some Australian headshops up until 2008 under the name *Dreamtime*. Its development is usually attributed to Palmer in 2003, who then coined the name in 2004, and himself suggests a herbal mixture with 20-30% DMT extract, or at least 50% DMT alongside MAOI extracts for enhanced and prolonged effects. Commenting on the so-called “changa effect”, i.e. the experiential differences from DMT owing to the MAOIs, he feels that changa allows for the retention of the ego where the

'come up' is gentler and the whole experience more grounded. The differences have been alternately described by Gaia's (2016) participants as encompassing being "more friendly and balanced", "more gentle and deeper...more healing", where the space "is easier to navigate" (p. 35).

As regards the basic structure of the changa experience itself, Palmer sets out five levels: 1) higher definition, clarity and crispness to reality, 2) closed eye visuals, especially geometry and fractals, 3) 'other dimensional' objects, landscapes and beings, 4) telepathic communication with entities, 5) more meaningful communication, mystical experiences such as unitivity and spacetime transcendence. Gaia (2016) conducted interviews with experienced changa users, reporting extensively on the qualitative content.

Relationship to the near-death experience

The present study aims to explore the relationship between changa and the near-death experience (NDE). A classical NDE is an altered state of consciousness when proximal to death or when physiologically impaired (for fuller experiential analyses see Cassol et al., 2018; Martial et al., 2020; Moody, 1975, Chapter 5, this thesis). Gaia's (2016) participants' experiences, of greater relevance to the NDE, include entry to parallel universes/other dimensions, magnificent natural scenery and wildlife, temples and beautiful cities, communications with entities such as religious authorities, experiences reminiscent of mystery cults of antiquity, or experiences discontinuous with one's own sociocultural background. Her category of "fantasy"-related themes appeared more reminiscent of *N,N*-DMT trips, entailing encounters with non-human/animal entities, including aliens, such as a big-headed, humanoid, gel-composed, floating creature; aliens conducting genetic reprogramming via green light-rays (a common motif, according to Gaia); or explicitly distressing experiences, such as aliens of darkness with hegemony of the planet.

Other experiences in this fantasy domain were, importantly, more alike to typical NDEs, such as a report of high-pitched noises, travelling at speed through a complex of timelines amongst familiar doctor-like beings, attempting to re-enter one's 'original universe'; or a vortex of white light, seeing a friend in robes, communicating information as to ecological matters. Gaia states *topoi* of death and rebirth to be not unusual, and her themes from the "spiritual-supernatural" category are more directly echoing of NDEs. These encompassed

divine beings and experiences of metaphysical meaning – specifically, a hyper-real, transforming presence of Kali (where the experient was, at least according to Gaia, naïve to this being, and Hindu deities were, reportedly, common with changa); entheogenic experiences of connecting to ‘the God within’; and one especially NDE- evocative report comprising sudden brightness, movement upwards at speed, disintegration of one’s life, identification with a creator, recognition of *maya* (life as illusory), sensation of dying, a cosmic void, extreme serenity, realisation that it is ‘not time to go’ and final re-birth.

Gaia (2016) discusses the electronic dance and psytrance music and festival scene to have played a central incubatory role in the spread of changa, and many of her participants had their first experiences in such contexts. Similarly, many interviewees reported using changa in ritualistic-ceremonial contexts, spanning setting intentions, creating alters, meditation, kundalini yoga, specific music, being amongst nature, singing, making contact with the plants or plant spirits or the elements. As such, the content of changa reports, generally and those above, may well be influenced by these effects of set and setting.

Rationale for the study

Pertinently for the present study, while the phenomenological or qualitative parities between many drug-induced altered states of consciousness and the phenomenon of near-death experiences (NDEs) have been more thoroughly investigated (Charland-Verville et al., 2014; Corazza, 2008; Jansen, 2000; Martial et al., 2019a), especially DMT (Chapter 5, this thesis; Strassman, 2001; Timmermann et al., 2018) – this has not been studied as regards changa’s relationship to NDEs. Indeed, a comprehensive semantic analysis of psychoactive drug states and NDEs (despite the inclusion of ayahuasca; Martial et al., 2019), as well as a survey of DMT entity encounters (Davis, Clifton, et al., 2020), seem to have deliberately excluded changa use. Many of Gaia’s (2016) above outlined reports show clear parallels to near-death experiences, indicating a need to dedicatedly explore their comparability. Additionally, Jansen (2000) and Grof (1994) appear to be the only works to include reports of individuals having had both a psychedelic and near-death experience, in the former case two persons regarding ketamine experiences, and one regarding LSD in the latter. While they were concluded to be essentially the same, this was not based on any systematic

comparison or analysis. This is as well as the preceding chapter to this thesis, where a 5MeO-DMT experience had been compared to an NDE within a singular individual.

As such, the present study aimed to systematically compare the NDE and changa experience, but specifically in those who are able to report undergoing both. Such a unique comparison may allow for appraisals by the participants themselves in terms of their subjective evaluation of the similarities or otherwise, which is here quantified, as well as for a more direct comparison of two different states in within subjects conditions versus between subjects. Any experiential similarities between the changa and near-death experience, especially in qualitative content, may be valuable not only as experimental models of the NDE state but as indicative of some combination of endogenous DMT, serotonin, dopamine and noradrenaline being implicated in the near-death process, given that changa contains DMT and upregulates the transmission of these monoamines. Two case studies are the subject of the present report, their experiences are provided at length, their content analysed in the context of their own, and typical, NDEs, and their features psychometrically compared.

Methods

The following outline of methods serves as a summary of the recruitment, materials, procedure and analyses which were elaborated upon in full in the methods section relevant to this chapter under Methods & Methodology (Chapter 2).

Two participants who have had both changa (a DMT-infused smoking blend) and near-death experiences (NDEs) were recruited, which was done via social media, the International Association of Near-Death Studies (IANDS) website, and by reaching out to participants from a prior DMT study. The only criteria for inclusion were at least one 'breakthrough' DMT experience and one NDE.

After receiving consent forms, video-call interviews were scheduled to explore the participants' experiences with changa and NDEs, their reflections on the similarities/differences, and their beliefs regarding the endogenous role of DMT in their NDEs.

Both perceptions of the extent of similarity and beliefs about the possible role of DMT were also quantifiably rated by the participants, and the Near-death Experience Scale (NDES) was employed, with participants completing it twice, once for the changa experience and once for the NDE.

The interviews were transcribed and analysed to identify both high-level and specific features of the NDE and changa experiences. The presence or absence of each feature was recorded and compared to features present in their own NDEs, as well as broader NDE literature. This provided a detailed qualitative supplement to the more restrictive psychometric data permitted by the NDES.

Results

Two case studies are here reported, presented sequentially, of two individuals who have undergone both a near-death experience and consumed the psychedelic admixture, changa. Within each, first the focus surrounds the qualitative dimension of their experiences, by summarising their NDE followed their changa experience, largely centring on an in-depth content analysis of each experience-type, presented in parallel and without repetition of content to facilitate comparison, and ending with participants' statements as to their comparability in their own appraisal. The quantitative dimension is then provided, beginning with participants' ratings as to perceived similarity and possible physiological implications of this, and concluded with scoring on the near-death experience scale.

Case Study 1: "SR", Male, White British

Near-death Experience, Misaligned vertebra, 1 minute duration – Summer 2017, Age 17

When SR used to play semi-professional football, one morning he woke up extremely fatigued and stiff, and as he pushed against the bedframe to stretch he felt and heard his neck 'click' (later verifying that his vertebrae had become misplaced, impinging on his oxygen supply).

He experienced momentarily disconnecting from and losing awareness of his body, the freezing of time, feeling "at peace, everything felt neutral, nothing was good or bad", and

the losing of his sense of self. There was an ineffable, familiar sense of being safe at home, “like déjà vu but not connected to anything, but able to ‘feel the past’”.

He reports that “energy was stretching out, encompassing space”, and he found himself visually elsewhere, as he “went into a kind of space and felt contact with a Mother energy...another being”. He relates another experience similarly difficult to express, of “flashing through a mystical light, when I snapped out and then snapped back into it...there was a light. It was somehow not within it, but it was more like being in space with stars- kind of? As if the stars made this light, but I didn’t see stars... I just flashed through the light – but when I was with the Mother energy I was in a kind of space with stars as light as if from a distance. A bit like the night sky.” He had a sense of receiving insight during his communication with this other being, and the implicit knowledge that even though he felt lost at the time “everything would work out fine down the line – and it did!”

He eventually felt that “time was running out”, which he later knew to mean the oxygen to his brain was running out. As the entity communicated with him, he suddenly snapped back to ‘reality’, where he says “when I came back, I felt like the presence had something to do with it, as if it put me back in my body”. He elaborates on this, explaining “I had to make a decision...to let my body die or let this entity take me back ...I didn’t consciously think, my instinct kicked in. It was as if I communicated with it and we decided together to go back – because time was quote-unquote ‘ticking’”. He was unsure as to exactly how or why he ‘came back’, but speculated that “maybe the moment wasn’t right, to die”. Despite the ostensibly less rich experience, he gave his NDE the same intensity as the changa experience (below), 9/10.

After this incident he noticed feeling extremely fatigued and (in December 2018) travelled to Rome to be treated by a respected osteopath, who identified and rectified a misaligned vertebra impinging on blood circulation. He also mentions the osteopath suggested that it was probably owing to a physical vulnerability from birth. Interestingly, *SR* recounts that “when I was born, I had the exact same experience [of being asphyxiated]”, as he was later told by his parents that he was choked by his umbilical cord.

Changa (30mg DMT on MAOI herb), 12-19 minutes – May 2019, Age 19

Upon smoking, *SR* felt his “consciousness elevated, and forgot about human concepts”, hearing a growing high-pitched noise, and as if he could see his friends’ emotions as the world pixelated around him. He then closed his eyes where he witnessed geometric-fractal kaleidoscopic shapes and lights and was redirected into and through a “tunnel”.

In the tunnel he stated it was like “sitting in a cinema room, but I was behind it, I was the awareness watching my body... watching lots of codes and numbers in the geometry”, which he knew to represent his emotions and experiences from the past, “like going into my DNA, stimulating it and feeling it... the essence of myself, but every part of myself over and over, timelessly, everything, then nothing, then everything, like in a circle”. He saw this code which “coded for parts of his life, and would feel it based on the codes seen, relative to my vessel [body]”. It also included elements which he couldn’t as readily understand or distinguish as his past experiences – concluding it may be unconscious, ancestral or even future experiences. He reported it as “not like a screen, as it was curved as if it was all around me... it was definitely more than 3D everyday experience, as I could shift through anywhere in space and time if I tried. It was like 360 degree vision, but it was difficult and took a lot of energy for me to. It was more like I felt everything at once”.

While around three quarters of the way through the tunnel, *SR* encountered a “female entity, a female energy presence communicating, not verbally but telepathically” with him. She appeared as a blue “old theatre mask”, who ‘talked through’ the geometry, showing images which he would interpret and translate into language, telling him “to reconnect with all of you, do not suppress parts of you” – a message of inspiration to discover and embrace his whole self. *SR* further qualified this being as “really loving, all I felt was pure love... There was a sense of laughter...a warm blanket of ‘it’s going to be OK’. I felt really safe, like I was a child and that was my mother – but like a Universal Mother, it felt like a mother energy... It felt like the Creator...like it was Everything in One, but a representation of everything; an expression of the universe if it could place itself in a person, or a being you could contact to communicate with”. She was complete, and pure love, who directed all of the imagery of his experience – and guided the fate of the universe. He sensed she held back, giving only a teaser, as he says every time his ego wanted to know more it made her keep a distance.

He experienced himself as an energy flying through the tunnel, at the end of which was a “metal gate, with gaps” which didn’t open and he couldn’t go through as it vanished as soon

as he approached it, while the “feminine entity went through the tunnel, evaporating when it hit the gate”. It felt like a signal of “you’re not ready yet” or perhaps, he said, he didn’t inhale enough to go through and the effects wore off. After asking what would have happened if he had gone through, he responded “Maybe my consciousness wasn’t ready yet. But it definitely felt like I could feel the energy, as I was getting closer something was growing inside of me. It could be a parallel or another realm – but I don’t know what realm I would’ve gone to”.

In terms of the sensory, emotional or psychological effects, he reported his senses to be mixed or muffled as “all one thing of being me”. The experience was “vividly dream-like... feeling more real than this reality, in the moment... but with a watery-fading effect”. SR felt a déjà vu sensation, as if feeling at home with the message of “you’re here again!”, as well as there being no concept of time. He mostly lost awareness of his body, but felt “more alive than alive, with a rush of energy flowing through every cell... electricity running through my body up to my brain”. He also felt as if the “[consensus] world was like a flat 2D plane... and although I was sitting down my body felt like jelly on the floor”. There was no identification of himself as “SR”, but retained his sense of “being a being with experience” – only upon seeing the codes representing his ‘self’ did he “realise who I was, I learnt during that cinema-stage... where I became my ego, but didn’t emotionally attach to it”. He didn’t feel he had any revelatory epiphanies as he “already knew I was one with the universe... the oneness wasn’t shocking as I already believed that... You learn it [from previous psychedelic experiences], but it goes into the unconscious... it felt like all the answers resurfaced”. He gave the experience 9/10 in intensity.

Table 6: SR – Content analysis of features from changa experience and Near-death experience, including presence/absence in general NDE literature

Content Analysis

Changa	SR’s NDE / NDEs General
Disembodiment	Yes

Rush	<i>No</i> / <i>No</i>
Ego dissolution	<i>Yes</i>
Noise	<i>No</i> / <i>Yes</i>
Hyper-empathy	<i>No</i> / <i>Yes</i>
Synaesthetic	<i>No</i> / <i>(Possible)</i>
Pixelation	<i>No</i> / <i>No</i>
Tunnel	<i>No</i> / <i>Yes</i>
Geometric/fractal	<i>No</i> / <i>No</i>
Life review	<i>No</i> / <i>Yes</i>
On cinema screen	/ <i>Yes</i>
360 / Hyperdimensional	/ <i>Yes</i>
In code	/ <i>No</i>
Time transcendence	<i>Yes</i>
Noetic	<i>Yes</i>
Flying	<i>No</i> / <i>Yes</i>
Entity	<i>Yes</i>
Feminine/Motherly	<i>Yes</i>
Masked	<i>No</i> / <i>No</i>

Presenting	No / Yes
Soothing	Yes
Guarding	No / Yes
Loving/Benevolent	Yes / Yes
Omnipotent + Omnipresent	(Unreported)
Telepathic	Yes
Gate / Threshold	No / Yes
Unity	Yes
Hyper-reality	No / Yes
Familiarity	Yes
Peace/Bliss	Yes
No	Light & Dark (simultaneous)
No	Outer space
No	Return / Sent back

Table 6 above shows that SR's own NDE was neither substantially different, nor only slightly different to his changa experience, but still notably distinct. Of the overall 33 features, 12 were common to both (36%), with such comparability lying in disembodiment, the general mystical components of ego dissolution, time transcendence, noesis, unity, bliss, as well as familiarity, and finally a sense of presence with motherly, soothing, benevolent and

telepathic qualities. The changa experience, however, was still highly comparable to the possible phenomenology of NDEs at large, where the only key differences with such typical NDEs lay in the sense of rush, synaesthesia, pixelation, geometry, code and a masked entity – with 24/29 *changa* content items as consistent with NDEs, representing an 83% similarity.

Participant's reflection on changa–NDE comparison

When asked to comment on how each experience felt in relation to the other, and if having undergone both experiences they believe endogenous DMT could have been involved, SR responded: "...comparing afterward [after the DMT]... [the NDE] did feel very, very similar... they all interconnect, overlapping with each other... the same feeling overlaid the whole experience...maybe in parallel spaces... I do believe that in the NDE, DMT was released by the brain, as when I had the DMT experience it was like *a déjà vu to the NDE*"

Quantitative Analysis

Could you rate on a scale of 1-10

i) how similar your *changa* and near-death experiences were
(1 = completely different; 10 = identical) = 8

ii) extent of your belief (if any) in the production or occasioning of your NDE being due to endogenous psychedelic-like brain chemicals, such as DMT
(1 = absolutely impossible; 10 = absolutely definite) = 10

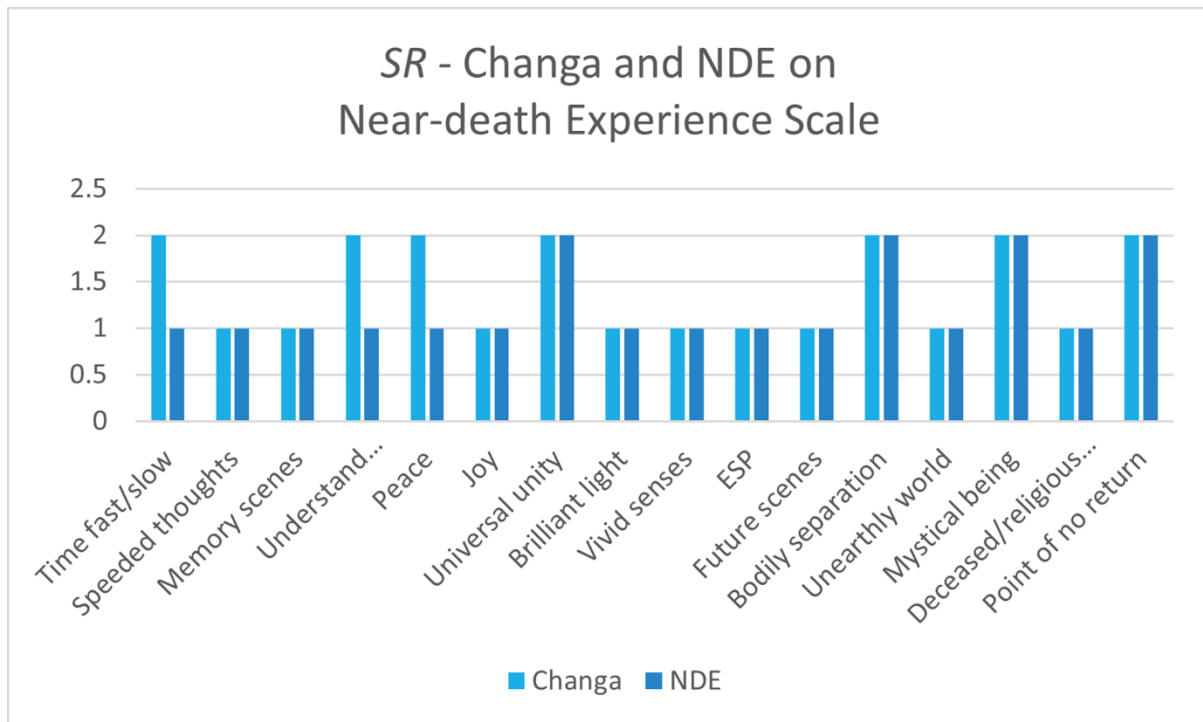


Figure 5: SR – Scores from the Near-death Experience Scale compared between the changa and Near-death Experience

Case Study Summary: Despite just over a third of the content being shared between the two experiences, SR in his own estimations considered his changa experience and NDE to be particularly comparable as suggested by his ratings of similarity and belief above. This is bolstered by his further quantitative scoring of the NDES (Figure 5, above), which scored 23/32 for changa and 20/32 for the NDE, by exhibiting almost identical results between the experiences – where 13/16 items were scored the same (81% similarity), except for the mystical-related elements of time distortion, understanding everything and sense of peace to be scored higher for the NDE versus the changa. These features were also present in the content analysis for both states, yet may have been more intensely experienced in the NDE.

Case Study 2: “DA”, Male, British-German

Near-death Experience, Allergic reaction (& Possible Cotard’s syndrome) – May 2020, Age

Episode one (Allergic reaction)

Before reporting his NDE, DA prefaces that in the preceding months to it he was going through “a lot of anxiety, fear, some symptoms of PTSD” due to previous experiences, but this allergic reaction precipitated a certain turning point, where he states “from then I had a very altered state of consciousness”.

DA describes a histaminergic reaction to being stung on his nose by enthusiastically smelling a “dwarf nettle plant that has been fasciated” (when a plant gets an infection which causes the genes of the plant to mutate), emphasising that such fasciation renders nettle sting’s “very very strong”. Owing to some symptoms reminding him of brain injury, some 30 seconds later he tried to alleviate his anxieties by lying down on his bed. Some 20 seconds later (within 1 minute total), he reports that he “felt this massive rush of energy... going up the back of my neck, a pain, very much physical sensation...and a sense of movement up to the top of my skull”, as well as a “sense of pressure that began on one side then started to move between both sides [of my head], then it ended up being really fast. This sense of pressure, pain, energy, heat that was flitting really really really quickly between both sides”. At this point he panicked, thinking ““WTF is going on, am I having a stroke or about to have a seizure?””, relating that he felt he “was on the brink of collapse, I don’t think I physically collapsed”.

Describing the psychological sequelae of the sting, he describes that “I began to have visual and auditory hallucinations”. Upon closing his eyes, he “began to have the most fascinating hallucinations. I had the Buddha’s face appear before me, these blue eyes, and I was dwelling in this space for a long time”. He also describes “kaleidoscopic hallucinations... It was more kind of, there were more lines, slightly more like looking into an actual kaleidoscopic than the visions you get with changa”. Approximately half an hour afterwards he says that “it got less kaleidoscopic and more detailed, closed eye visions of basically becoming one with what appeared to me as these Buddha eyes. I was dwelling in this blueness, it was a very lovely feeling”. He elaborates on this feeling of identification with this Buddha image, and the nature of it as an entity offering a communication: “it was a feeling of merger, I felt they were external but also felt that, there was a feeling of me absolutely kind of merging with that colour, those eyes, that atmosphere... a very clear communication about peace and just, relax... definitely felt like it had a will, and it was

positive, and it was holding me in this blue space... these eyes are my eyes as well, I'm seeing in these eyes in the place where my eyes as well, in some ways this is a mirror"

In respect to time perception *DA* expresses that "Time felt very very warped, like time had slowed down but only because everything, my thoughts seemed to be very fast in comparison to things going on around me". In relation to bodily awareness, he instead resided in a deep contemplative state amidst the Buddha eyes, explaining "I was really no longer aware of my body, and I would compare it to a very deep state of meditation in that I wasn't thinking... I was quite deep in a state of concentration, or I don't remember having many thoughts or much of an internal narrative at all, more a sort of dwelling".

Episode two (Cotard's syndrome-like, Ketamine trigger)

DA himself offers that he is not sure if he would categorise the above as a 'near-death experience', given that he "had no idea whether, physically, I was actually near to death". However, he elaborates that "certainly during that point and couple of weeks after, this last phase of this episode, I was convinced I was dead".

After the above delineated experience, he explains there was approximately a week where he described himself to be "in a very peak state" – followed by a period of a week of relative 'normality' – until, "partly triggered" by an instance of using "a lot" of ketamine, a further week and a half of a return to "a heightened state". He clarifies that halfway through this second period of some elevated state of consciousness, "all sorts of things happened in my mind at that point to try to explain what was actually going on, all sorts of weird and wonderful ideas". This eventually culminated, through a process of elimination as to the ultimate cause of this experience, in *DA's* concluding that "the only logical explanation I can find for this was, I must be dead", a conviction which played out for up to five days. He reiterates that he could not understand his experience with any alternative, compelled to believe that "I have transitioned in some way to some form of different dimension, realm, reality, state of consciousness".

Then articulated by *DA* is an arduous attempt to pinpoint how he may have died, which evolved into a "life recall" of his entire life, in which he "was digging up memories that I had no idea were still there...in a lot of detail, quite photographic recollections of memories. Exploring all sorts of stuff in my life". In expanding on the content of this life-review-like

episode, and its valence, he conveys a “tendency toward looking at the negative, and it was more at times a conscious effort on my part to also view the positive... voluntary interspersals of ‘No, this was pretty good and this had really positive effects on other people’”, where he considers that this more accessible negativity was linked with “how terrifying this whole experience had become for me, I was like ‘Well shit, I must have done some really bad stuff to be in this space where everything is so fucking terrifying, potentially after I’d died!’”. Reflecting the interpersonal emphasis during evaluations of one’s life, *DA* highlights that “it felt very empathic, in that I think I was putting myself in the shoes of other people”. Yet he eventually surmised that this largely harrowing experience felt it must be a natural consequence of his actions toward others, as the experience “would kind of fast return in the loop to *me*, in that it was so interspersed with this uncertainty, unknowing, this fear of being in this place that was a really scary place that I don’t know whether it had an end- so there was this feedback loop of ‘Ok well, so I did this action that had these negative consequences, and that’s scary because it seems – Is the sum of all these things what I’m experiencing now!?’”

Through the review process, he felt he could select other moments in his life where “maybe it went a little weird afterwards”, that is, other incidences which could have precipitated his ‘death’, which again instantiated the notion that “I have to entertain the possibility I’m dead’”. He is initially shocked – ‘Well I’m surprised that that’s what death is like, you don’t even know you fucking died!? Like come on guys, that’s not fair is it!?’ – but soon reconciles that irrespective of the ambiguity over his death, he felt that “I was in a place where I was judging all these things in my life, I was having this self-judgement, like, ‘Did I, could I’ve acted differently in this way?’, ‘God, my ego was out of control right there’, ‘God, I treated this person really badly’. But then also looking at positive actions as well. I was like ‘Ok, I feel like I’m in this stuck place, so maybe I am in some kind of realm, some in-between realm, maybe I’m some kind of ghost, maybe I’m in some hungry ghost realm’, maybe in a place where I’m not able to move on because I’m not dealing with particular things”. That is, he integrated these realisations by coming to the knowledge that he “need[s] to make sure that I’m addressing these, I don’t know whatever, karmas, samskaras, or even simply just the way I feel about things that have happened in my life, and the way I lead my life – or death! – from now on’”. Regardless of whether I’m alive or dead, as he poignantly

formulates it, “it’s still the same outcome: I still need to live life as self-compassionately and compassionately towards others as possible”. He frames this experience as eliciting “an emotional outpouring”, leading to a conversation with a friend in Thailand who’s a long-term practicing Buddhist, and later with his mother.

Upon taking a “very small amount of Valium, like 2mg”, he slept for a few hours, woke up and “it was like everything was mostly- in terms of the altered state of consciousness- pretty much back to normal”. Since the abating of this experience, *DA* reports that he has been, and continues to be, working through a great amount of integration. These encompassed some provocative, metaphysical lessons he feels he has taken from it – “Well, I’ve never known, really, the *true* nature of my reality and everybody else’s reality. Sure I may not know if I’ve actually- I may well have died, but how do I know that I was ever alive!?” – as well as certain changes he felt important to make to his life, after contemplating that, “it was interesting that the whole thing resolved for me when I finally, really came to peace with the idea that I might be dead, I might be alive, whichever way round – it’s still the same thing”. Such a conclusive teaching he received from the experience, irrespective of his mortal status or the ontological musings thereof, is movingly rendered in his final words:

“I couldn’t think about anything else actually – it seemed very clear that in those few days, which eventually brought about the end of this experience for me, coming to terms with this – [that] it was so strongly about the implication of my actions and how I...could change or act differently in the future, whatever that future was. Whether that future was in life, or whether that future was in wherever I was now! I simply didn’t know whether by coming to the end of this review and coming to terms with this, did this mean that I was gonna shoot out of my body and be reborn as a cow!? I have no idea what’s gonna happen! But whatever the outcome is, it’s still the same – I still need to learn the lessons from this experience, and those lessons are all about suffering and compassion, basically”. He gave the experience a full 10/10 in intensity.

Changa (50% DMT freebase + *B. caapi*), 20 minutes – September 26th 2019, Age 32

The very first sensations *DA* described surrounded an aperture and geometries, giving way to anxieties and a fear of dying: “there was kind of a portal, a kind of circular or spherical

shape of patterns, and yeah then a wave of kind of fear and panic came over me where I suddenly felt, 'Woah is this kind of too much...this is really really intense, what am I doing, where am I?' And yeah this feeling like I was dying or going to die, and that kind of levelled out". About his body he relates that "my body wasn't really relevant to that at all, I was just very much in this place of experience, I wasn't aware or conscious of my body".

From this bodily disconnection he emerged into another circus-like space inhabited by a threatening being: "it was quite sort of carnival-esque and there was an initial...sort of entity that was a kind of jokery-type trickstery character with very long fingers, and was basically at the beginning telling me to 'Fuck off'. Yeah (laughter)!" *DA* parallels this to other prior experiences of his, since converging on the conclusion that "its sort of part of my psyche, like feeling like telling me that I'm kind of not worthy or accepted in this experience. So yeah it wasn't a scary or shocking thing when that entity came up, it's kind of quite usual". The "menacing presence" of this being, "pretty aggressive, pretty hostile", yet also "really powerful", manifested in the clown-resembling form of "a jester, a joker wearing what looks like a kind of jester-type hat. It wasn't really a hat but part of its being". This ambivalence or trickster-reminiscent duality was echoed by seeming to *DA* to be mirroring of certain personal dimensions of his own, saying that "I perceive this entity to be a part of myself...that doesn't feel worthy, that feels unlovable, that feels not good enough. A part of myself that doesn't want me to have, doesn't want me to love myself"

This multidimensionality to the jester continues, where *DA* points out that "at the same time it's welcoming me, because its right at the beginning as well. Like Ok, 'Hi familiar face'... [But it's also] telling me to fuck off! I suppose welcoming in terms of it just- greeting me with a fuck off!" Similarly, the jester is couched in terms of providing "a kind of test", as he serves a gate-keeping-like function at the juncture of the portal, "like 'Are you gonna, Can you get passed me?', basically". This lends itself, as *DA* sees, to a notion of the entity as "actually a bringer of wisdom and healing", connected to the concept of its resonance with his own internal processes, on account of how "it requires quite a lot of strength to face that and say, 'Ok there's this fucking aggressive, quite scary thing telling me to fuck off', just 'Get the fuck out of here' basically. Sort of pushing through that to see that, just as a kind of resistant part of myself, and once I can do that, if I'm able to do that, then it just kind of evaporates, it lifts". *DA* contextualises his encounter by bringing to light the historical

representation of this 'trickster' figure: "In different kinds of philosophies and spiritualities around the world, there's often this jester, trickster figure, who is kind of an interdimensional traveller... this idea of using comedy and play and drama to kind of almost, well to teach people things, but also veil its own power... Playing the fool, yeah exactly, but this idea that actually, certainly in Europe anyway, the jesters in royal courts held a lot of power"

Upon the dissolution of this chapter, *DA* then inhabits some hypercolourful realm characterised by a certain fun freneticism, described as "quite a playful, carnival-esque kind of almost like a playroom with lots of kind of moving objects, that were like very very much alive, yeah lots of colours... but it was so intense at that moment that it was kind of like being on a fairground ride, just so much that was too much to really take in". Upon being asked to elaborate on why he felt 'carnival' or 'playroom' would be the best descriptors for this space, *DA* illuminates that it was related to "the joker/jester, the intensity of it, the sort of whirling and full-on-ness of it all, the playful- it felt playful, like there were these things that were like living toys, there were things that were playing with each other, like a sense of push and pull, swirling around, this was happening all around me, this sense of movement and play interaction... very colourful".

The subsequent scene to his experience involved a mysterious, fluctuating light associated with a sense of movement as if guided by others: "I started to get like a really very very vivid sort of purple or purplish light or colour, it wasn't really a light, just a total kind of absorption...and it was flickering on and off, and I was aware that if I brought my attention upwards in my mind toward my 3rd eye toward my crown, it would become more solid... at the same time there was a kind of whooshing sensation, with sort of not quite hands, but just this sort of sensation of 'Yes go up there, direct your attention up there'. So I then kind of focused on it and it was almost bathing in this light, it felt really really beautiful, really comforting". Further qualifying this multifaceted 'light' encounter, *DA* depicts it as a light which was simultaneously "emotion and vibration and sort of energy, yeah all of those things at once". In responding to the sentient nature of this light, *DA* was initially uncertain, but did state that "I definitely felt like the light was alive for sure... It was like this huge rush of energy, coming out what felt like coming out of my 3rd eye, then it was like everything was kind of juddering, this white light was really really alive. It wasn't like it was just light, it

was like it was feeling as well, it was rushing into my body and all around my body, I could feel it in my fingertips and in my shoulders, and in my face and in my jaw particularly as well”.

A definitive sense of the presence of ‘another’ was evoked by “the way [the light] was being directed into me, I felt a kind of sentience in that there was a kind of guide, something that was guiding that experience and guiding that light”.

The light’s oscillations then transitioned into a transportation through and into a darkness, yet one which appeared to be yet another dimension to this, magical-seeming, light: “[It] became a sort of outward projection, then everything went black, but still shimmering and vibrating, and I felt like I was shooting through something, through some kind of atmosphere. And I had this sensation like I was in space, and yeah that I was going upwards, and I was really just sort of letting this blackness in, but yet at the same time, I also had this sensation that it was the same thing as the white light. And that also felt like this really sort of comforting feeling, that behind this blackness is light”.

Later, the aforementioned guides, not visually manifest yet apparently behind the light and his transportation, were further fleshed out by *DA*, as he relates that “I had this sensation that there were these beings there, who had guided this process of shooting into space, and who were offering sort of protection and healing”. This “very strong energetic experience” was felt by him to be “guided by these like Star People entities that as I mentioned before I’ve experience with on ayahuasca and DMT, but also just sober with yoga as well”, and their demeanour was one of total benevolence – “just loving. I think love is just the best way to describe it really. I think maybe a sort of like an intention of like compassion and wanting the best for me”.

Finally, for this arc of his journey, *DA* adds further nuances to this experience of glistening void, whose paradoxical vitality in its dead space, encoding a powerful symbolism, suffused him with a profound sense of reassurance: “[T]he transition from the purple light to the fluttering euphoric white light, then to the sort of projection into darkness... what was really really beautiful about this was I was in this darkness, I let it- I let myself go through it, let it fully encompass me, and I had this deep deep sensation and knowledge that the fluttering light was still there actually. That it still felt the same, so either the white light was still

behind it or it was literally the same thing as the white light just in a different form... it felt like there was life there, simultaneously it felt infinite and expansive like there was nothing, but at the same time it felt like it was filled with everything... although I kind of experienced it as a white light flooding in, the fact that it was flickering meant that there was darkness, that it was going between light and dark really really quickly”.

As regards time perception, DA stipulates that “there were points which definitely felt like a time expansion, and then other points a time contraction. But timelessness would definitely be the best way, or a kind of bending of time”. And ultimately, even as the experience was winding down, he “felt like [his] 3rd eye was so so open, like energy was just flooding in and out of it at such a huge rate, and it felt amazing”, until he felt himself finally reassociating with his body, and the visions began to fade out. He gave the experience a markedly lower intensity vs. the NDE; 6/10.

Table 7: DA – Content analysis of features from changa experience and Near-death experience, including presence/absence in general NDE literature

Content Analysis

Changa	DA’s NDE / NDEs General
Tunnel	No / Yes
Portal	/ (Possible)
Panic / Confusion	Yes
Sense of dying	Yes
Disembodiment	Yes
Carnival-esque scene	No / No
Playpen	/ No
Transforming toy-like objects	/ No
Sentient	/ No

Playful	/ No
Flux	/ No
Entity	Yes
Joker/Trickster	No / (Possible)
Menacing	No / Yes
One with entity	Yes
Powerful	Yes
Guiding	Yes
Teaching	Yes
Healing	Yes
Overwhelm	(Not reported) / No
Colourfulness	(Not reported) / Yes
Translocation	Yes
Presences	Yes
Hands	No / (Possible)
Guides	Yes
Healing	No / Yes
Loving/Benevolent	Yes
Humanoid	No / Yes
Highly evolved	No / Yes

Bright light	Yes
Flickering	No / (Possible)
White	Yes / Yes
Synaesthesia	No / Yes
Rush	Yes
Light & Dark (simultaneous)	Yes
Outer space (Alien-like)	Yes
Beauty	(Not reported) / Yes
Letting go	(Not reported) / Yes
Time distortion	Yes
Ecstasy	No / Yes
Noetic / Personal insight	Yes
Unity	Yes
No	Buddha's eyes
(Not reported)	Friendly / Peace
(Not reported)	Geometry/Fractals
(Not reported)	Clear mind
No	Life Review (inc. self-judgement)

No	Limbo / In-between
(Not reported)	Loving
(Not reported)	Speeded thoughts
No	Hyper-empathy

Table 7 above indicates that *DA*'s changa experience was comparable to *SR*'s above, in terms of overlap with their own NDE, where 21 of the 51 total features were shared between both (42%). This common experiential ground lay in a feeling of confusion, dying, and disembodiment; mystical elements of time distortion, unity and noesis; sense of presence with powerful, guiding, teaching and healing qualities, with which they felt oneness; translocation elsewhere, further presences with benevolent qualities; bright white light, a bright darkness, and alien-resembling feelings. Similarly to *SR* above, almost all elements of *DA*'s changa experience is identifiable across the repertoire of NDE phenomenology, except the changa state's inclusion of a carnival-esque environment, and the presence of geometric displays in their NDE – with 35/42 *changa* content items as consistent with NDEs, also representing an 83% similarity.

Participant's reflection on changa–NDE comparison

When asked to comment on how each experience felt in relation to the other, and if having undergone both experiences they believe endogenous DMT could have been involved, *DA* responded: "Without a doubt... I'd absolutely say there was clearly, probably DMT pumping around my body in bigger amount [during the NDE]... Obviously, having used external substances to change my consciousness has a large bearing on the way I now frame that [NDE] experience [i.e. after experiencing psychedelics like DMT, the NDE can be linked to DMT]"

Quantitative Analysis

Could you rate on a scale of 1-10

i) how similar your *changa* and near-death experiences were

(1 = completely different; 10 = identical)

6

ii) extent of your belief (if any) in the production or occasioning of your NDE being due to endogenous psychedelic-like brain chemicals, such as DMT

(1 = absolutely impossible; 10 = absolutely definite)

9

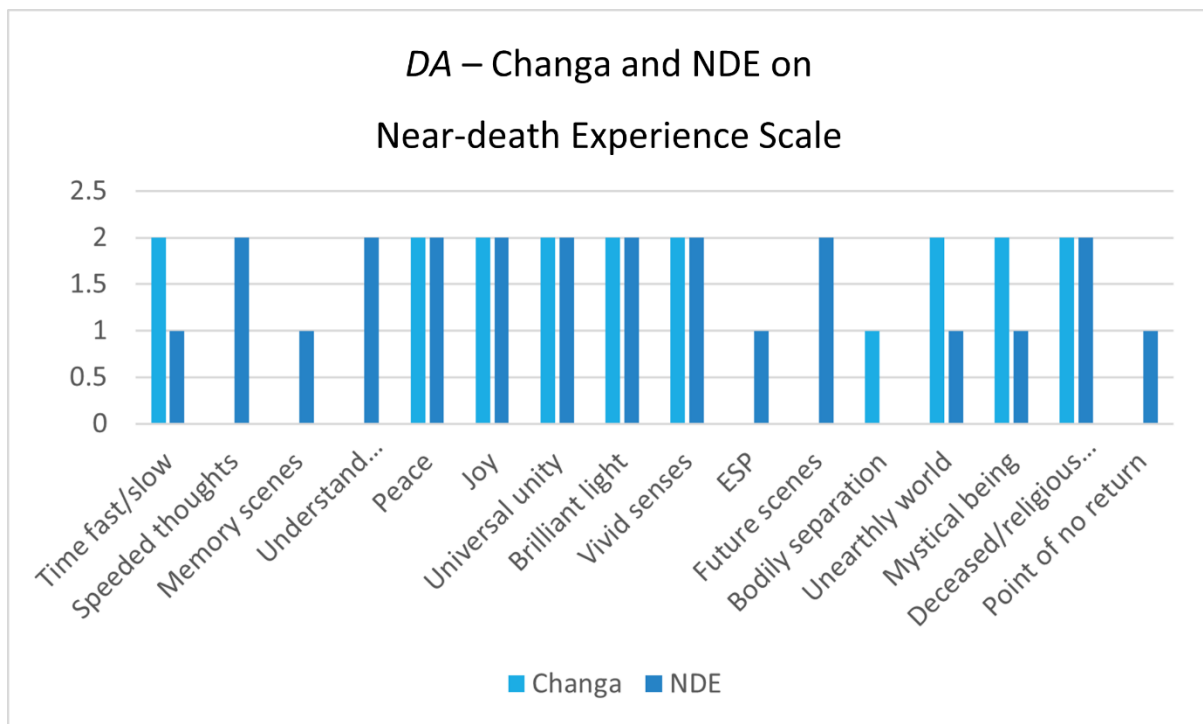


Figure 6: DA – Scores from the Near-death Experience Scale compared between the changa and Near-death Experience

Case Study Summary: Just over 40% of the content appears to be common to both the changa and NDE experienced by DA according to the content analysis, which is somewhat

mirrored in the participant's own estimations as indicated by their ratings of experiential similarity above (6/10). The rating as to belief in the likely implication of endogenous DMT in his NDE is higher than the similarity rating, echoing his personal statement as to prior drug experiences generally permitting the linking of these with such 'natural' states as NDEs. The NDE Scale results were 18/32 for changa and 24/32 for the NDE, and also suggest a mixed relationship between the two states (Figure 6, above), where 6/16 items were scored the same (38% similarity) – except for time distortion, body separation, entering another world, and encountering an entity being higher for the changa; where speeded thoughts, scenes from the past, understanding everything, extra-sensory perception, scenes from the future and coming to a threshold of no return were higher in the NDE state.

Discussion

Content items: Low similarity in case studies, high across NDEs

Two case studies were presented of experiencers of both the *N,N*-DMT- and MOAI-containing changa and near-death experiences. Each participant had changa experiences which, according to the content analyses (Tables 6, 7 above), were moderately similar to their respective NDE – and this was comparable between the two cases (36-42% overlapping features). When contextualising in the wider phenomenological literature of NDEs, despite this moderate similarity almost all features are observable in NDEs – except rush, synaesthesia, pixelation, geometry, code, masked entity, and (in *DA*) carnival-esque environment across the changa reports, and geometry in *DA*'s NDE. These, explicitly enough, represent the more prototypically psychedelic, especially DMT-related, themes, and are conspicuously absent across the vast majority of NDEs – as has been thoroughly evidenced (chapter 5, this thesis). This being so, also strongly emphasised in chapter 5 of this thesis, many NDEs can be very idiosyncratic in nature and as such more closely echo such psychedelic/DMT states. An example of this is the entity presenting itself as a mask in *SR*'s changa experience, where one NDE reported in chapter 5 (and reproduced in Appendix C) involved a similar being manifesting as a face, and was on the whole tremendously DMT-resembling. In this way, this changa experience, though not incomparably to many DMT

trips, was mimetic of such idiosyncratic NDEs.

NDE features in changa, and psychedelic features in NDE

Additionally, *SR*'s changa experience incorporated being taken to the foot of a gate, symbolic of some border of 'no return' to another space. This is an especially interesting finding, as such an overt threshold feature is almost never encountered across psychedelic/DMT reports, but is an especially prevalent element to NDEs – again, as reported in chapter 5 and also suggested by others (Greyson, 2014; Timmermann et al., 2018). As such, *SR*'s changa trip reproduced this typical NDE feature, interestingly despite the possible neural or psychological rationale for its typicality in NDEs, such as expectancy given proximity to death. This being so, one study appears to have found no insignificant differences between any NDE scale items, including the threshold, between many NDE-like events, including drug states, with no proximity to death and classic NDEs (Charland-Verville et al., 2014). But (as discussed in chapter 5) subjective feelings as to death-proximity may still arise in such NDE-like conditions, including changa here. As to the inclusion of geometric arrays in the NDE of *DA*, again this may constitute an idiosyncratic component of an NDE, as such a dimension is classically the domain of psychedelic/DMT experiences. While such geometry was not explicitly reported in their *changa* state, it is highly likely given their near-ubiquitousness.

High vs. moderate personal similarity rating and scale scoring

Regarding the quantitative analysis, again, despite the fairly low similarity according to the content analysis (Table 6, 7), both cases indicated a very high level of confidence in their belief that endogenous psychedelics, like DMT, could be contributive to their NDE (*SR* = 10/10, *DA* = 9/10). Though, in terms of experiential comparison between their changa and NDE states, *DA* indicated somewhat less comparability (6/10) than the other case, *SR* (8/10) (despite the content analysis showing marginally higher similarity than them), which was more aligned with their content analysis similarity (42%).

In terms of the psychometric analysis, one case, *SR* responded virtually identically on the NDE scale between both experiences (13/16 items as same, 81%), despite only a 36% similarity reflected by the content analyses. Though this suggests an extremely strong

reproduction of their NDE by the changa, it also highlights a relatively marked discrepancy between the participant's first-person ratings compared to the third-person content analysis of features. However, such content analyses (or thematic analyses in general), over and above questionnaire administration, are a significantly more in-depth method with greater opportunity to highlight differences not otherwise captured, and thus they likely offer greater fidelity to the experience (chapter 5, 6). Again, more aligned with their fairly low content analysis similarity, the other case, *DA*, presented with much more mixed results on the NDE scale between the states (6/16 items as same, 38%). Many of these incongruences covered entering another world and encountering an entity being higher for the changa – which is continuous with previous comparisons of the pure *NN*-DMT state and NDEs (chapter 5); as well as scenes from the past (life review), extra-sensory perception/scenes from the future and coming to a threshold of no return being higher for, and thus possibly more quintessential to, the NDE state – also continuous with chapter 5's findings (and Greyson, 2014).

Predominant differences in content items and qualitative content

It may be reliably stated that the *N,N*-DMT experience may consistently reproduce the basic features of an NDE, where the nuances of the content represent a fork in the road of comparison at which point the two experiences diverge (Chapter 5) – and the 5MeO-DMT experience may dependably generate the classical mystical dimensions of experience, yet is itself content-free (or maximally content-rich, which may be synonymous) and may not exhibit the rich 'interactive-relational' (Strassman, 2014) dimensions of an NDE (chapter 5). However, regarding *changa* and the findings presented in the current chapter, conclusions as to the precise way by which this experience may represent an NDE are more ambiguous.

As delineated above, it is critical to note that all but a handful of features from the changa reports are locatable across near-death experiences in general, where interestingly both case studies demonstrated an 83% consistency with NDE phenomenology. However, more central to the present study, a notable proportion of elements of the content are comparable to the case's *own* NDEs, but a great deal, in fact *more*, is not. This may, in large part, be owing to one NDE, *SR*, being relatively shallow, as illustrated by the original transcript summary (despite the NDE scale suggesting otherwise), as well as the other's, *DA*,

perhaps ultimately representing more of an 'NDE-like' experience (Martial et al., 2018), i.e., with comparable phenomenology yet without clearly life-threatening conditions. Though the main inclusion criteria for participants was to report an NDE involving some degree of physiological stress to denote them as classic NDEs, DA's was peculiar and evidently complex in that – though it was indeed initially triggered by an allergic reaction and physiological symptoms – it in fact spanned a number of weeks, and seemed exacerbated by a ketamine trip (itself related to NDEs: Corazza, 2008; Jansen, 2000; Martial et al., 2019b), and demonstrated some symptomatic overlap with Cotard's syndrome (in turn characterised by a conviction of being dead, Mobbs & Watt, 2011). It could be speculated that if the NDEs of the present case studies were of more of a 'breakthrough' nature, or more canonical such as by heart attack or coma, the comparability drawn by the present study may have been more dramatic – also suggested by higher proximity to death resulting in higher NDE scale scores (Martial et al., 2019b). This said, Cotard's syndrome was included as one of the *NDE-like* experiences compared against classic NDEs which found no phenomenological differences (Charland-Verville et al., 2014) – which is versus the evident non-typical content of DA's NDE, suggesting that the content may still be different.

Both participants' changa reports may have shared most features with NDEs at large (83%), but echoed the qualitative content in an idiosyncratic way, and thus mirrors the NDE in a similar way to how *N,N*-DMT does – and as such, a preliminary conclusion may be that changa may be just as representative of NDEs as is *N,N*-DMT alone (chapter 5). Naturally, the main limitation to the present study is the reliance on only two single case studies, which makes any final interpretations premature and constrains the generalisability of any findings substantially. Yet, changa's effects being vastly due to the presence of *N,N*-DMT (where the harmala alkaloids may prolong/enhance effects, though normally only if in extracted form), meaning a near-chemical equivalence, bolsters this conclusion. Caveating this is that the proportions of DMT-MOAI in the participants' changa is not known or well quantified, which could usefully inform as to rationale behind identified experiential similarities/differences, representing a limitation of this study.

Other means of similarity, e.g. chronology

One theoretical speculation as to why the *changa* experience, specifically, may be of particular interest to investigate as per phenomenological resonances with NDEs, is the fact that the presence of *NN*-DMT and harmala alkaloid MAOIs (increasing monoamine activity) roughly corresponds to a pivotal finding in the neurobiology of the mammalian dying brain, that a host of neurotransmitters are released in highly significant concentrations (especially at 3-4 minutes), including (though not limited to) DMT itself (Dean et al., 2019), serotonin, upon which DMT acts at the 5-HT_{2A} receptor, and the other monoamines of noradrenaline and dopamine (Li et al., 2015). Martial et al. (2019b) also identified drug experiences (including ayahuasca, DMT and 5MeO-DMT) involving the monoaminergic system to very closely parallel the NDE state, despite excluding *changa* prior to analysis, where Liester (2013) also concluded the ayahuasca state to be similar enough to the NDE to draw mechanistic parallels. The interest in a search for an especially NDE-resembling induced experience, and its possibly more effective clinical application, is elaborated in the discussion of chapter 5).

The overarching sequence, in rough chronological order, of demarcated events (excluding the diffuse mystical components, which are themselves accepted NDE features) of both the present case studies' *changa* experiences incorporated the following: For *SR* – disembodiment, a noise, flying through a tunnel, a life review (as if on a 360 degree screen), hyper-empathy, a benevolent god-like entity, and a threshold-like gate. For *DA* – confusion, a sense of dying, disembodiment, a tunnel, a powerful, teaching entity, translocation elsewhere, other humanoid evolved beings, bright white light, and light-dark/outer-space-like environment. In approaching the experiences in this way, contrasted to the previous conclusion, all these elements are *remarkably* evocative of NDEs – even if not the specific NDEs which each case presented with. If included within the cases of *NN*-DMT experiences in the comparative study with classic NDEs (chapter 5), they would be included amongst those specifically highlighted as especially “*NDE-like*” (akin to participants *LG* and *EM*).

Other than the obvious sense of dying, as aforementioned – the threshold and life review may be especially associable with NDEs (Chapter 5; Greyson, 2014), the commonest features have been found to be disembodiment, bright light and mystical beings (Charland-Verville et al., 2014), and there seems to be an emphasis on the tunnel phenomenon across

NDEs after the phenomenon's popularization in 1975 (Moody, 1975; Athappilly et al., 2006). Even as regards the general essence of the sequencing, the progression, e.g. from a tunnel, through a life review, to a threshold (SR's changa) – or a tunnel to a white light amongst another world (DA's changa) – is essentially the arc of the prototypical NDE. While no strict temporality of NDEs was strictly evidenced, a comparable, general progression has been noted from the experience of light, followed by the main narrative structure such as entity encounters, and finally border and return (Martial et al., 2017).

Different features, same features with different content

As mentioned, there are several features in the present changa reports which are not to be found amongst general NDE reports. For SR, this entailed – a rush, pixelation, synaesthesia; while for DA – a rush, synaesthesia, carnival surroundings, a playpen, and transforming, sentient toys. These are all extremely classical of DMT phenomenology (and *not* that of NDEs), where the motifs of a carnival-like environ, playpens and toy-like objects in flux appearing alive have all been reported multitudinous times (McKenna, 1993; Chapter 3; Strassman, 2001). Turning from the presence/absence of features (the structural phenomenology) and toward the qualitative content, that is, the subjective variation of each such basic element – SR's tunnel was described as being composed of geometry, his sense of empathising with others was in a synaesthetic form, and his life review was graphically represented in a type of code. For DA – the tunnel was articulated as a portal, the original entity he met was a menacing joker character, and he reported a rather ineffable “alien feeling” about one part of the trip. In this way, the content in both cases manifested as idiosyncratically DMT-like, and thus was dramatically divergent from that typical of NDEs. This was similarly the case with the two aforementioned *N,N*-DMT participants (LG and EM, in chapter 5) where, though highly NDE-resembling, the content was still of a classically DMT aesthetic.

Motivation to replicate the NDE

One intriguing point to consider when investigating individuals having had both such psychedelic drug and near-death experiences is the timing of each. In the case of DA, his changa experience was prior to his NDE, however, in both the case of SR, and another case

reported of an individual with both an NDE and 5MeO-DMT experience (chapter 6), the drug experience was subsequent to the NDE. While it wasn't clearly reported as to the intention of the changa experience, in the 5MeO case it was abundantly evident that the purpose of the psychedelic experience was to attempt to 'return' to the world to which they had penetrated during their original NDE, and to try to engender the same transformative effects, as was already the person's practice via the use of certain musical frequencies. This directly echoes the postulation (Shushan, 2009, 2018) that it may have been the near-death experiences of our ancient ancestors which, owing to their evidentially personally salutatory and collectively prosocial influences (e.g. Lake, 2019), lead to communities deliberately seeking to reproduce them through inductive techniques ('archaic techniques of ecstasy', Eliade, 1951). These would often include the use of entheogenic substances (as well as music, drumming, dancing, physical injuries, austerities such as food and sensory deprivation) which also confer such adaptive community-binding effects (e.g. Dupuis, 2021), and in so doing, lead to the development of the initiations and rituals which result in 'soul flight' into the 'other world' characteristic of shamanic societies (Michael J. Winkelman, 2019).

While this motivational progression from NDE to psychedelic journey is known to be operative in the 5MeO case (chapter 6), and speculatively so in *SR's* changa case study here, it should also be acknowledged that *DA* is a regular psychedelic user and has undergone further journeys since his reported NDE (*DA, personal communication, 28th October 2020*), where again, speculatively, such an intent of returning to, in order to reanimate, the original NDE may have been one motivation. However, given the NDE as being reportedly very challenging, a greater motivation may have been for the purpose of understanding and integrating the experience via a partial re-induction of it. In future work researching NDEs and psychedelic experiences in single individuals, attention should be made to their chronology and the specific intentions of the participants to evaluate the above inferences.

State-dependent memory

Finally, the matter of state-dependent, or mood-congruent, memory should be addressed, which refers to the phenomenon where people are better able to retrieve memories when in the same neuropsychological state or mood they were in at the time of encoding. The use

of psychoactive substances is often employed to induce certain mental states during learning of information and test recollection in sober and the same altered state, where positive results have been identified for stimulants such as methylphenidate (in those with ADHD; Swanson & Kinsbourne, 1976), and especially for depressants such as alcohol (Weingartner et al., 1976) – yet mixed results were produced when evaluating, the comparatively more ‘psychedelic’ THC (the main psychoactive compound in cannabis; Schoeler & Bhattacharyya, 2013). In this way, the case studies presented herein entail a state induced by an NDE and one by a psychedelic agent (in whichever order), which have already been evidenced to share significant phenomenological overlay and possibly neurobiological, and the main aim of this study is to identify their similarities or differences in a within-subjects manner. This indicates the possibility that the information encoded in the original state, i.e. that of the content of the experience itself, may be better reactivated upon entering the second state. So if indeed the experiences resulted in a very high degree of comparability, this could demonstrate the occurrence here of state-dependent memory, and importantly substantiate the hypothesis of the NDE being mediated by similar neurochemical mechanisms as the psychedelic experiences. As regards the results of the present study to address this, the conclusions are ambiguous. Even though the psychometric results of *SR* were near-identical between changa and NDE states (though mixed for *DA*), and the personally rated and articulated comparability of the two (particularly *SR*) were relatively high – the content analyses, at least within-participants, revealed only a moderate comparability (36-42%), and as such possibly undermining the above processes being, at least majorly, in play and in turn a DMT + monoamine hypothesis of NDE physiology. Future research is encouraged to explore the state dependent memory effects of classical psychedelics themselves, and also in the context of comparison to NDEs as in this study.

Conclusion

The present chapter’s study offers a novel comparison of a poly-psychopharmacological experience with near-death experiences, as well as uniquely using participants reporting both experience-types, with systematic qualitative and quantitative methods – thus significantly improving on the scant investigations thus far, and representing a substantial

contribution to the overarching, psychedelic-NDE comparative project. Compared to NDEs generally, features of the changa reports were largely consistent with NDEs, where some NDE-associated features (e.g. threshold) were also present in the changa, and chronology is arguable more NDE-congruent. Though, compared with the participants' own NDEs, the changa was markedly divergent, and across all conditions the level of qualitative content was idiosyncratically different (akin to *N,N*-DMT). Future within-participant studies of psychopharmacological modelling of near-death experiences, including with changa, are indicated, where these should include greater sample sizes, ideally with more classical NDEs, and measures of MAOI-content to extend the present precedent-setting exploration of possible neural mediations of this important phenomenon.

Chapter VIII: Discussion I

The present and subsequent chapter will constitute the first and second part of the discussion of the thesis and adhere to the following structure. The first part will initially include a section reiterating the overarching and specific aims of the present thesis, alongside the main findings of each study. The next section delineates the potential applications based on the studies' results, caveated by the limitations present in each. The penultimate section covers the propositioned future work which would help in overcoming the limitations of this thesis' studies, but also in answering the questions the studies have usefully revealed, to progress the overarching project of elucidating the NDE phenomenon.

This is then followed by the second part of the discussion, which extends beyond a summary of the aims, findings, applications, limitations and future indications of the thesis, and toward the implications of the studies, oriented around the neuroscience, scholarship of religion, anomalous experiences and possible overarching models to frame the experiences.

After these chapters, a final conclusion is offered threading together the major study findings, and also ultimately drawing on certain ontological implications as expounded in the immediately preceding discussion chapter.

Summary of aims and findings

The overall aim of the present thesis was to investigate psychopharmacological and experimental models of the near-death experience, with special focus on the *N,N*-DMT experience, with the hope to thereby understand the potential neurochemistry of the near-death experience. This was accomplished by elucidating the quality of the experience of one candidate, *N,N*-DMT, then comparing this in a between-group manner with near-death experiencers, and finally comparing in a within-participant manner, utilising both 3rd and 1st person approaches, with the analogous substances, 5MeO-DMT and changa. The concretely stated aims, as stipulated in the introductory chapter (minus the first which referred to the introductory and discussion chapters' review of the neuroscience and so were non-empirical), for all of the studies of the present thesis were as follows:

- 1) To understand the nuanced quality of the *N,N*-DMT experience, by conducting a naturalistic study and performing a thematic and content analysis of the experience, including those thematic elements relevant to the near-death experience
- 2) To make systematic comparisons between the above DMT analysis and prior thematic analysis / extant data about the near-death experience i.e. Between-groups comparison of the DMT and NDE
- 3) To construct case studies, qualitative and psychometric analyses of experiencers of both changa and NDEs i.e. Within-subjects comparison of the DMT/analogous experience and NDE
- 4) To construct case studies, qualitative and psychometric analyses of experiencers of both 5MeO-DMT and NDEs i.e. Within-subjects comparison of the DMT/analogous experience and NDE

The first empirical chapter ('An Encounter with the Other') identified that, in a naturalistic setting with experienced DMT users at minimum 40 mg dosage, 96% of our participants reported encounters with, normally, multiple entities who were typically of a benevolent and guiding nature, yet who took on a myriad of forms, mostly of a generally alien-like quality. Suggested neural correlates of the encounter were given, but their elaborately complex nature was concluded to elude present understanding.

The second empirical chapter ('An Encounter with the Self') dedicated as it was to how the DMT experience affected the participants themselves, showed pervasive effects in the domains of body, sensorium, psychology, and emotions. The emotional impact was especially profound, where potential for psychotherapeutic use was endorsed (though caveated). For both these studies, the internal consistencies within the naturalistic study were highlighted, and consistencies with other DMT studies were also emphasised. This was even at the level of specific content, as opposed to gross features, which is of particular note (and may have ontological implications) given that cultural transmission may be unlikely due to the other supporting studies not involving experienced users (as in our study) but many of whom were naïve to such DMT content. Again for both, yet especially

the former, while shamanic or folkloric phenomenology was reminiscent, the abduction or extra-terrestrial encounter phenomenon bore the greatest resemblance.

The third empirical chapter ('An Encounter with Death') included multiple levels of analyses, but may be summarised by the following: All features of the NDE were reproduced by DMT, however some more (e.g. entities) or less (e.g. the threshold) by DMT, as according to the psychometric and content analyses. The qualitative nature of the content of the DMT experience, however, which was the primary thrust of the study, was evidenced to be (to paraphrase the conclusion) intense, prodigious, bizarre, kaleidoscopic, non-biographic, extra-terrestrial, cross-cultural, artificial, infantile, archetypal, atavistic or mythological. While the NDE may certainly consist of archetypal imagery, as well as have perinatal parallels, it overwhelmingly lacks these other dimensions, tending to be more self-referential and culturally consistent. This, however, is not ubiquitous, where some 'idiosyncratic' NDEs are compared with which were in this sense, DMT-like in content – and some DMT experiences were isolated also which were NDE-like (though the content in the latter was generally still stereotypically psychedelic). As such, DMT was considered to be an 'occasional, partial NDE-ogen', and best approached as an 'NDE-mimetic'. The 'mimetic' qualifier, however, may ontologically connote an inability to produce 'authentic' or 'real' near-death experiences, as may be the intention by some with the use of the term 'mystico-mimetic' to imply failure to create as genuine experiences as those 'naturally-occurring'. While by definition DMT experiencers are not near death and so the experience may only ever correctly be categorised as *NDE-like*, this new term 'NDE-mimetic' is meant only to be ontologically neutral. The fact of DMT in this extensive though limited way mimicking NDEs undermines endogenous DMT's major biological contribution near-death. Though it retains its candidacy as a therapeutic treatment, yet perhaps not as effective as one of a less overwhelming and extra-terrestrial nature and one closer to the prototypically transformative NDE.

The fourth empirical chapter ('This is your Brain on Death') found that the 5MeO-DMT experience was found to overlap with the NDE of the case study in the mystical experience quality, as classically described by the mystical experience questionnaire, especially time-space transcendence. It is arguable that it is deep NDEs (such as that of the case study e.g. reporting 30/32 on the NDES) which tend to incorporate this mystical experience, and thus

may be engendered by 5MeO-DMT – as suggested by Ring's (1980) finding of progressively fewer experiencers reaching the 'deeper' layers of his NDE measure i.e., past the 'light', as well as Owens et al. (1990) finding those closer to death to more often report the light phenomenon, which is itself associated with the 5MeO state. As such, this experience may be more appropriately considered to be like the 'death' state, mirroring as it is of the 'Clear light' of the Tibetan book of the dead, which may have ontological connotations of its mediation independent of the brain. In contrast, the comparatively dualistic features of the case's NDE may be better modelled by *N,N*-DMT, as well as by, in a non-mutually exclusive manner, perinatal recollection or lucid dream mechanisms. Given the relatively 'content-less' nature of this mystical experience, endogenous 5MeO-DMT may well provide a physiological contribution to this dimension of the NDE – however this may be hindered by an arguable inaccessibility of the 5HT-2A receptors due to the encephalitis. Despite this, the interruption of layer V pyramidal or high-level inhibitory networks by this aetiology may in some way still mimic the downstream action of psychedelics – which could be an alternative, or supplementary, mechanism in any near-death aetiology, especially traumatic brain injury.

Finally, in the last empirical chapter ('Smokable Vine of the Dead'), a 3rd person (i.e. researcher analysed) content analysis illustrated a moderate similarity of the case studies' changa experiences with their near-death experiences, though a high similarity with NDEs at large. Further 1st person analyses (i.e. via self-reports) yielded mixed similarities, according to the NDE scale and participants' qualified and quantified perceptions, wherein one subject rated their experiences as almost identical, versus the second subject rating theirs as less comparable with only some features replicated. A small cluster of features of the changa experiences, especially a threshold appearing as a gate concomitant with a message that the experiencer was not ready (i.e. to cross), as well as both experiences' generic sequence, were highly reminiscent of NDEs. Though, in both, the qualitative content of said features was still categorically DMT-resembling. The less NDE-resembling nature of the second case may be owing to the NDE being non-classical (without significant threat to life), where DMT (though formally categorised as 'NDE-like' itself) may more closely model classical NDEs due to possible endogenous release in hypoxic conditions. Similarly, this second may undermine, though the first may support the implication of DMT or the monoamines (pharmacological

targets of change) in NDEs, under the framework of state-dependent memory, where content at encoding (the original NDE) may be more accessible if similar conditions are present at retrieval/recollection (the subsequent change experience).

Applications and Limitations

Applications

In elucidating the *N,N*-DMT, 5MeO-DMT and change experience and their resonance with the NDE, this may have many implications for application, essentially clinically, all of which described in their respective chapters, yet may be summarised in the following.

The otherworldly breakthrough by DMT echoes the abduction phenomenon and NDEs, which in turn confer beneficial changes like eco consciousness, spirituality, less death anxiety, connection to self/world/others. Less psychopathology itself has been noted as a possible outcome, for example, amongst a psychiatric outpatient population, including a range of disorders such as depression, bipolar and other psychoses, those who reported NDEs were generally less psychopathological (Greyson, 2003). Many such outcomes are likely intimately linked to the subjective experience itself, such as the entity encounter (and other anomalous features) possibly engendering both insight and psychological flexibility which are psychotherapeutically valuable.

Many elements of the self-bound DMT experience, such as sense of dying, acceptance of death, ego disruption or ego preservation when convinced of being dead, symbolisation of death-related themes or disembodiment, all mirror the therapeutic approaches of exposure therapy, existential therapy, ACT, psychodynamic therapy or self-transcendence – in a way which alleviates fear of death, which may itself be perpetuating of general psychopathology. For instance, the DSM classifies pathological preoccupation with death as one criterium for depression, and Moreton et al (2023) identified that reduced death anxiety mediated the mystical experience's effects on the reductions in negative affect and improvements in positive affect. That is, regardless of the disorder in question, qualities inherent in the psychedelic experience which address existential angst could have trans-diagnostic salutary potential. Though, a crucial caveat is the ontological shock, which may mediate flexibility, may also presage traumatisation, mainly for any psychedelic naïve, vulnerable psychiatric

populations, or the ‘uninitiated’ in such effectively religious experience. The non-personal and extra-terrestrial content may also constrain DMT’s applicability in psychotherapy, especially in end-of-life treatment – even though the dying-pertaining themes will be valuable – given that such content fundamentally demarcates it from the NDE. This said, the science-fiction-esque quality of DMT such as the “alien” encounter may be partially owing to expectation (see Limitations, Chapter 3), and if they did occur, alien abductions, though harder to integrate versus NDEs, are linked to positive changes in the self, not limited to reduced fear of death (e.g. Strassman, 2001). The profound emotional impact, understanding and release also importantly constitutes ‘emotional breakthrough’, which has, understandably, been linked to better outcomes after psychedelic experiences.

Especially in respect to Chapter 5, the NDE can be considered the prototype for engendering personal transformation, or so-called ‘conversion’ to a religiospiritual orientation – where idealist/dualist metaphysical beliefs after psychedelics are correlated with enhanced wellbeing (Timmermann et al., 2021) – so a highly effective psychedelic therapy should be one which most emulates the NDE. DMT showed some, albeit limited, fidelity to the NDE – whereas, high dose psilocybin could be a superior model (Michael, 2022b), or other substances or indeed combinations (like that explored in Chapter 7 with changa) with complex psychopharmacology which echoes that near-death. An example of this is *ibogaine* from the iboga root (with serotonergic, glutamatergic, cholinergic and dopaminergic activity), which phenomenologically, also commonly produces a ‘life-review’ effect, and is often considered an ‘oneirogen’ given its deeply dreamy state – where NDEs, in their being linked to psychedelics (e.g. Martial et al, 2019), can also be legitimately considered as dream-like (e.g. Sanz et al, 2018).

Not explicitly discussed in the respective chapters were the applications of 5MeO-DMT or changa. The participant of the 5MeO study stressed a felt difference that the NDE provided dimensions of deep learning about life lessons, for instance about substance abuse, which the 5MeO experience lacked. However, 5MeO has been shown to be clinically useful in substance use disorders (Barsuglia et al., 2018), and the mystical experience, which the 5MeO was fundamentally characterised by, from psychedelics in general have been associated most strongly with improved outcomes in addiction (Kangaslampi, 2022). Notwithstanding, the intimate link between the mystical state and therapeutic outcome and

its powerful and universal occasioning by 5MeO makes it an important candidate as a clinical agent, where its producing of the deepest NDEs which contain this dimension and which are the most transformative is also testament to its potential. This transformation is linked to conversion, and the participant shifted from atheist to non-physicalist post-NDE which was itself concurrent with his elevated wellbeing (Timmermann et al., 2021).

Regarding changa, while there was expressly stated motivations by the prior 5MeO participant to take the substance to return to the NDE space, this was possible with one case of the changa study, though unstated in the other. However, this latter volunteered their use of other psychedelics since their NDE partly with the intention of attempting to comprehend their experience, as such indicating an application of these substances, if not to re-enter the NDE 'world', to assist in the integration experience. While Michael (2022a) proposed the need for psychotherapy (before and) after a near-death experience mirroring the (preparation and) integration of psychedelic therapy, a case could also be made for employing psychedelics themselves in a controlled manner for the purpose of integration after an NDE, given that over a tenth may be of a deeply distressing nature. Given the more abduction-esque content of DMT (as argued in Chapter 5) vs NDEs, DMT could similarly be a candidate in helping integrate abductees' experiences – which are typically more ontologically challenging and difficult to integrate (albeit, re-triggering potential must be mediated in any such therapeutic process). Lastly, the preliminary observations that changa may in some ways be more like NDEs (such as having some features normally absent in *N,N*-DMT or their chronology) deserves further scrutiny to determine if they are better inducers and thus more apt therapies for reasons above outlined.

Limitations

The varying methodologies used in the multivariate evaluation of psychoactive agents in relation to NDEs employed in this thesis were not without their limitations. Again, these were elaborated in the discussion of all the relevant chapters at length, and so the reader is referred to these sections. However, one unexpanded point regarding Chapters 3, 4 and 5, analysing data from the DMT field study, would include the use of experienced DMT 'psychonauts' and thus priming the data for certain content associated with this subculture. However, this was necessary for not only ethical reasons, but for a rationale which may compensate for the expectation effects by allowing for a highly skilled and careful focus

during and navigation of the DMT space itself and articulation thereafter, which directly echoes the enlisting of experienced DMT users in recent continuous infusion experiments as part of an explicit project to retrieve the nuances of the deeply reconfigured conscious experience by those experienced in doing so, where repeat, and continuous exposure would feedback to further enhance this (Timmermann, 2022). Two more unexpanded points regarding Chapter 5 would include that only classic, anoxic NDEs were compared with, versus other NDE-like episodes for instance, where the experiences may have otherwise been concluded to be *more* like one another than this thesis suggested, given that DMT is an example of an NDE-like experience, or *less* like one another, if indeed DMT is produced in anoxic conditions like those compared with in this study. However, even though Charland-Verville et al. (2014) and Facco & Agrillo (2012) conclude that NDEs are the ‘same’ irrespective of threat to life – and there being many reports of meditation (Gordon et al., 2018) being able to produce *more* features than typical NDEs, or hypnosis (Schenk, 1999; Ohkado & Greyson, 2018; Pederzoli et al., 2019) producing all or most, or epilepsy and other temporal neuropathologies producing some features like OBEs (Blanke et al., 2004; Hoepner et al., 2013) – this ‘similarity’ is fundamentally only at the level of phenomenological structure, that is, experiential features, compared to the level of qualitative content which was the focus especially of Chapter 5 of this thesis. In other words, if NDE-like NDEs vs classical ones were compared with, the same conclusion would likely be made i.e., that the DMT experience is distinguishable by unique content – but further research is indicated to corroborate this. Additionally, in Chapter 5 the adapted and extended themes of the NDE from Cassol et al. (2018) were used to begin with as the reference point with which to compare the DMT themes, and as such those content items present in DMT but *not* the NDE were not included in the prevalence analysis – however, these were explored in tables attached to the appendices.

Finally, one fundamental limitation of the present thesis as a whole may be the following: Qualitative analyses used here have provided experiential illumination of the psychedelics and the NDE itself, and the epicentral thrust of not only Chapter 5’s conclusions, but also of the subsequent chapters comparing with 5MeO and changa, surrounded the qualitative content divergences undermining DMT’s role in the NDE. However, such analyses are certainly not the ideal-most tool for ascertaining if DMT or analogous substances are

implicated in the NDE. Of course, the direct-most technique to deduce this would be microdialyses such as that performed by Dean et al. (2019) of endogenous DMT during animal model death. Future work to substantially contribute to this overarching project may thus include the simple measurement of blood concentrations during spontaneous hospital deaths or near-death (akin to Klemenc-Ketis et al., 2010 re: CO₂; or Parnia et al., 2001 re O₂) – or comparatively more complex, logistically and ethically, neuroimaging using PET via radioisotopes linked to the investigated compound, or fMRI for non-pharmacological but functional imaging, which may be quasi-experimental in a prospective manner, for instance, recruiting convicts receiving capital punishment or those seeking euthanasia. While ethical approval of this may be challenging, the consent given by informed participants and the immense and direct evidence this would provide for the neurobiology of the dying process, not to mention the ontological ramifications this may have, should be duly considered by approving bodies. An alternative, however, though improbable, may be to survey the literature which may include or contact researchers who may possess the accidental data gathering of such neuroimaging during medical events such as cardiac arrest or stroke.

Future Research

Many indications for possibilities of future research have been suggested above, either from limitations of the studies within the present thesis or from other studies. However, the overarching research endeavour regarding the phenomenology, neural or other physiological correlates, and the ontology of psychedelic and transpersonal experiences, namely the DMT and near-death experience, could benefit greatly from a host of other investigations. Some of these studies would include those for which data and partial analyses had been collected for the present thesis, but where limitations of time and length precluded their incorporation.

Such studies entailed further case studies of individuals experiencing both near-death and *NV*-DMT experiences, which similarly to Chapters 4 and 5 of this thesis (experiences of NDEs and 5-MeO-DMT, and NDEs and changa, respectively) would expand on the unique vantage point these participants have to personally comment on the phenomenological relationships, while also increasing the sample from the few included here. Additionally, the raw interview data gathered by Rick Strassman on which “DMT: The Spirit Molecule”

(Strassman, 2001) was based was shared to the present authors. A more systematic content analysis of this would more comprehensively characterise the reported DMT experiences – but where a comparison of this almost 30 year-old DMT study with the more recent DMT field study (upon which many chapters herein were based), would help elucidate any changes over time in DMT phenomenology (which may be due to propagation of DMT-pertaining memes) and represent a further means – in the same vein as Chapters 2-4 of this thesis – to explore the internal theme consistency of the experience. A comparison as well – in the same vein as Chapter 4 – with the near-death experience would be especially instructive, not only to replicate, or otherwise, the conclusions of the present thesis as to the phenomenological similarity – but if the findings are replicated with this older DMT study, then given less opportunity for the propagation in popular consciousness of associations between DMT and near-death experiences in the intervening years, this may suggest such comparability being less due to cultural influence. Finally, studying altered states of consciousness – mainly psychedelic but also, for instance, sleep paralysis, hypnosis, etc – in the blind, and most interestingly the congenitally so, would complement the findings of Ring & Cooper (2008) showing putatively visual NDEs in the blind. In this way, if blind subjects also reported apparently visual experience during, for example, psychedelic episodes, this could again represent a further domain in which NDEs and psychedelic states may be paralleled and suggest the possibility of endogenous psychedelics inciting NDEs. Such a research project extends from very scant studies exploring the effects of psychedelics in blind humans (Krill et al., 1963) and monkeys (Siegel et al., 1976); the visual nature of dreams in the blind (Bértolo et al., 2003) – however see (Kerr & Domhoff, 2004) – and some evidence that ayahuasca can cause remission of, at least acquired, aphantasia i.e. ‘mind blindness’ (dos Santos et al., 2018), whereas DMT may not be capable of doing so in congenital aphantasia (Luke, 2018) – while acknowledging clear mechanistic differences between Aphantasia and optic tract blindness. Further phenomenological reports from the DMT field study involving participants with aphantasia are also in preparation, which may bear on the capability for visual imagery to account for certain features (such as entity encounters).

Other possibilities for further reports predicated on the DMT field study include one investigating the capacity of DMT to be conducive to precognition (Luke, 2019), where any

suggestion of this, given the parapsychological components of NDEs, may represent more support for endogenous DMT's implication near-death. Ontologically, any evidence for psychedelic's conduciveness to psi, in turn suggesting nonlocality of consciousness, enhances the feasibility of the survival hypothesis as gestured to by near-death experiences. Additionally, investigations into the post-acute effects from DMT on wellbeing, cognitive, existential and personality domains – as already suggested by ayahuasca's clinical outcomes (Dos Santos et al., 2018; Loizaga-Velder & Verres, 2014; Murphy-Beiner & Soar, 2020; Palhano-Fontes et al., 2019; Zeifman et al., 2019) or the several clinical trials of DMT underway (D'Souza, 2021; Liechti & Ley, 2020; Scheidegger, 2021; Steiner et al., 2020; Devlin & Bhatt, 2022; Erritzoe et al., 2020) – would comprise an entirely parallel project to compare DMT and NDEs (in terms of long-term influence versus experiential effects). Namely, NDEs have been evidenced to engender a litany of after-effects which significantly mirror those positive outcomes after psychedelics, for instance in respect to decreased existential anxiety and materialistic worldview, enhanced sense of transcendence, self-worth, concern for others and for the natural world, spiritual wellbeing and meaning in life (Groth-Marnat & Summers, 1998; Sutherland, 1990; Khanna & Greyson, 2013; Van Lommel, 2002). Lastly, a classical priming study, wherein the video content showed to participants on the field study in the control condition, that is prior to DMT intake, could involve a content comparison between the video material and the subsequent DMT experience. Not only would this explore the sensitivity of DMT to priming, versus other psychedelics, which has not been studied – but if priming were evident, this may bear on the ontology of the DMT experience.

Originally planned projects included in the proposal of the present thesis but not finally incorporated related largely to the physiological correlates of the near-death experience. For example, an investigation into the resting-state EEG activity of those who have undergone NDEs and comparison with those who have not would, given its retrospective nature, wither help indicate neuroelectric changes or baseline predispositions to reporting NDEs. While general spiking activity has been explored retrospectively (Britton & Bootzin, 2004), more nuanced cortical excitability measures of said EEG activity, specifically, have not been. Such excitability analyses may also be applied to participants in DMT studies and correlated with its NDE-like quality, which in a prospective manner could help disentangle

the predictive power or consequential nature of the excitability. Also, a similar study could also be carried out looking into blood concentrations of endogenous DMT (versus EEG correlates) of NDEs – where, for instance, the possibility of higher such concentrations predicting NDE reports may be supported by higher endogenous DMT at baseline linking to higher increases in DMT after cardiac arrest in rodents (Dean, *personal communication*). Finally, on a phenomenological level, qualitative analyses of experiments currently underway researching a continuous infusion protocol of DMT administration would represent an important opportunity to not only chart the subjective effects of a maintained peak DMT experience, but the greater chance for subjects to recall content may assist in the exercise of comparing and contrasting with the NDE.

Other recommended research projects would include the testing of the above suggested hypothesis that any release of endogenous psychedelics near-death could influence the perception of intrinsic sensations evoked by neural hyperexcitability, such as in the optic tract, leading to the tunnel and light effect (Blanke et al., 2015). For example, presenting DMT participants, during their experience, with a simulation of such a growing disk of light on video, and identifying if reports include a transformation of the basic stimulus into the more complex tunnel imagery common in NDEs. Studies into the reverse of this, that is, similar intrinsic neural activity, namely epileptiform activity – versus psychedelic release – itself influencing the psychological impact of released psychedelics, could also be instructive. For instance, reports of the enhancement in the psychoactive effects of psychedelics during seizures (in epileptics or spontaneously), thus mimicking any concurrence of seizure-like activity and endogenous psychedelics near-death, could rebut claims of the insufficiency of DMT alone to account for the NDE (Nichols, 2018). This parallels suggestions by Borjigin (Borjigin & Chavez, n.d.) that the unique state of the dying brain, for instance in its compromised state, could reduce the threshold by which any released endogenous DMT may exert significant psychoactive effects. Finally, one considerably important research project would entail the phenomenological and content analyses of near-death experiences resultant from specific aetiologies involving focal lesioning to the brain. One study has already qualitatively explored NDEs from traumatic brain injury (TBI; Hou et al., 2013), though without analysing any possible link between the location/type of cortical injury and the experience – while only one other has specifically

tried to associate focal lesions, namely in the brain stem, with any differences in NDE content (Charland-Verville et al., 2015), finding less positive affect. This overarching project could systematically explore structural phenomenological differences, using the NDE scale, between neuropsychological patients of different lesions, from TBI or stroke, thus identifying the possible neural origins of different NDE features. Finally, the evident resonance between DMT and the near-death experience, indirectly, links NDEs and abduction/alien encounter tropes which should be analysed further, and this thesis' exhibiting of DMT to replicate NDEs by some dimensions and including a poly-pharmacological model (changa), and other studies showing ketamine to be perhaps an even more reliable generator (Martial et al., 2019a) indicate a need to explore participant reports of experiencing both in tandem.

Chapter IX: Discussion II

As introduced at the start of the previous chapter focussing on the immediate implications of the thesis, this second part of the discussion will attend to the wider inferences from the studies relating to broader, and sometimes more speculative, framing of the experiences and their relationship. This will firstly entail a section dedicated to proposed neural rationale for major qualitative differences identified between the near-death experience and DMT/5MeO-DMT/changa, a comprehensive review of the psychedelic neurosciences, the neuroscience of the NDE, and that of the dying process in animal models and lastly in humans, including the overlap of psychedelic neuroscience with the latter three. The next section introduces the relevance of the scholarship of religions, centring on a particular theory of the afterlife possibly supported by cross-cultural comparative analyses of NDEs. The later section presents anomalous phenomena, also hitherto only mentioned in the preceding chapters (e.g. Chapter 7, regarding the case's OBE and Peak in Darien report), which are well-correlated with psychedelic and NDEs and may challenge the neurocentric focus elsewhere in this thesis. The fifth section approaches the fundamental question of this thesis i.e., How are the DMT and near-death experience comparable, and why is this? Beyond the neurochemical and cognitive neuroscientific frameworks expounded throughout this thesis, this section begins to present supplementary theories, including that of morphic resonance. After this chapter, a final conclusion will be offered.

'Phenomeneurology'

Neurophenomenology is characterised by the aim to bridge the sometimes considered unbreachable gap between activity of the brain (quantified by 3rd person measurement) and experiences within a person's mind (1st person subjectivity), by providing a level of "2nd person" mediation (e.g. Petitmengin, 2006; Varela & Shear, 1999). This typically entails the performing of neuroimaging as a subject undergoes their private experience, followed by either detailed phenomenological questionnaires or in-depth structured interviewing, where close correlations are made between the reported subjective state and the evidenced neural state. Pertinent examples of this include Timmermann et al. (2019), whose

participants rated intensities of peak visual, bodily and emotional experiential domains of their DMT experience *in situ*, which were then, respectively, correlated to elevated theta and delta, diminished beta and enhanced entropy. The present section of this thesis' discussion, including the segments dedicated to neural correlates in Chapters 3-6, can be considered to represent a reversal of this particular approach, as the primary body of research pivots around phenomenological and qualitative analyses, which are then associated with prospective neural structures, networks or other activity motifs as derived from the neuroscience literature – for instance, the known, established functions of said structures/activity or previous neural correlates identified for specific experience features. As such, this may be here termed 'phenomeneurology'. One example of a similar approach from the psychedelic sciences includes Winkelman, (2017, 2018), who in chartering many aspects of psychedelic phenomenology, especially the visionary and entity encounter phenomena, links these to speculated neural modules associated with intrinsic functions (Gardner, 2000), but more robustly, to findings from the psychedelic neurosciences, normally focusing on DMN disintegration and global desegregation. The current section in this chapter will constitute such a *phenomeneurology* for the present thesis' discussion on the qualitative harmonies and discordances between the DMT and NDE state and their plausible neural, or neuropsychological undergirding.

Explanations of DMT and NDE experiential differences

To begin with the differences, predominantly in content, though sometimes structurally, it is especially instructive to highlight the differences between the known neural features of NDEs and the psychedelic, especially DMT, state. As emphasised as part of this phenomeneurological project, such differences may be highly explanatory as to the qualitative differences.

The more prolific range of content in DMT compared with the NDE

Regarding the comment in the discussion of Chapter 5 of the more limited range of content in the NDE state compared with the more extensively varied content of the DMT state, firstly, this could be interpreted on a sociological level. For instance, it may be relatable to the heavy influences of both Christian and Spiritualist narratives on NDEs (Schlieter, 2018),

the former for millennia and the latter for centuries, which themselves carry relatively restricted doctrine, defining one's expectations of the experience near-death (versus such social contagion for lore around DMT being only since its popularisation). Returning to the neural hypotheses, however, the relatedly greater stability, and lesser fluidity, of the NDE state is also notable – where this may be seen as comparable to the lucid dream state (itself normally more structurally integral than the regular dream state). NDEs have been semantically associated with serotonergic (and dissociative) psychedelics (Martial, et al., 2019a), which were in turn semantically linked with lucid dreaming (Sanz et al., 2018), and the principle of internal awareness within a sleep-like state is also attributable to the NDE state. Neurally, the lucid dream-state is characterisable by greater frontopolar volume (Filevich et al., 2015), gamma activity over the dorsolateral prefrontal cortex (Mota-Rolim et al., 2012), and functional connectivity between distinct frontal and temporal association regions (Baird et al., 2018) – where comparably, NDE regression has led to fronto-temporal gamma elevation and orbitofrontal, mPFC, temporal and parahippocampal activity (Beauregard et al., 2009), as well as frontal monitoring of end-of-life care withdrawal showing gamma-like high-frequency spiking or neural correlates of emergence from anaesthesia (Auyong et al., 2010; Chawla et al., 2009). Further, such potential circumscription or stability may, on a neural level, may be connected to a relative lack of entropy and greater top-down control – despite the possibly rash inclusion of the 'near-death experience' within a list of high-entropy states (Carhart-Harris et al., 2014). Parallel to this, for awakening via neural complexity increase to transpire with psychedelic treatment in disorders of consciousness, there may be a possible requirement of intact neural systems supporting minimal consciousness (Gosseries & Martial, 2020). Otherwise – such as in NDEs with sufficiently impaired brains – it may only lead to limited enhancements in content richness, and thus possibly accounting for the more circumscribed content (versus DMT, as in the present study, within a healthy brain). The putative predictability of this NDE 'story board' is curious, especially considering the multifaceted complexity of what occurs neurally near-death, versus the singular introduction of exogenous DMT producing prolific content. If richness of conscious content is associable with brain entropy, the latter likely induces far greater levels of entropy, compared to the brain near-death which (though may include endogenous psychedelic release) could be marked by relative preservation of higher-order inhibitive networks (like the DMN), but certainly involves the aforementioned high-

frequency, especially frontal, gamma activity, which usually subserves short-range/local network communication (Barrett & Griffiths, 2018; versus the slow-wave long-range/distal signalling associated with psychedelic global connection and entropy).

The tunnel, OBE, encounter with the deceased, the threshold, ego loss and sense of dying

Crucially, there is no anoxia under psychedelics or DMT, which is otherwise the defining trigger of (most) classical near-death experiences, and which may elicit a host of phenomenological features near-death (as mentioned above). This includes hypoxia, disinhibition and excitotoxicity of the optic tract, correlating with movement toward a light via a more traditional tunnel (Blanke et al., 2015), as well as the hypoxic interruption of the TPJ, correlating with the OBE phenomenon (Blanke et al., 2004, 2015). Both of these phenomena are definitive features of the NDE, (Charland-Verville et al., 2014) and evidently not of the DMT state, as clearly illustrated in Chapter 5.

Elaborating on the tunnel effect, the elaborate complexity of the tunnel imagery in the DMT state, distinctly different to that of NDEs, may not be simply accounted for by the occipital lobe activity generating form-constants (or entoptics; Cowan, 2013), but possibly the functional connectivity of the visual areas with higher-order association areas (e.g. Carhart-Harris et al., 2016; Tagliazucchi et al., 2016) which may lead to elaborations of the basic tunnel motifs into more iconic structures. Psychologically, the tunnel feature seems significantly likelier after 1975 (the popularisation of the NDE; Athappilly et al., 2006), though this distinct tunnel & light process of NDEs cannot be reduced to belief effects. The feeling of moving through a dark space in NDEs is a cultural and historical quasi-universal (Kellehear, 2008; Shushan, 2018 i.e. sometimes manifesting as walking along a road in, e.g. native american societies - though, again, the milky way is envisioned as a 'road' by these societies), as is eventual apparitions of light, where the application of the word 'tunnel' is likely a recent western invention. Neuropsychologically, more than mere post-hoc artefact of interpretation and reporting, the stimulus of light (due to above neural processes) may introduce itself as an imagetic suggestion to a brain under the influence of endogenous psychedelics (possibly DMT), which in a top-down fashion may interpret the basic dark-with-light sensation to construct a more categorically tunnel-like percept.

Continuing with the OBE, the total lack of classic OBEs in DMT yet their high frequency in NDEs is again most simply ascribable to neural factors, where near-death anoxia disrupts the tactile, proprioceptive, and vestibular integration and thus construction of personal space supported by the TPJ (Blanke et al., 2004, 2015), resulting in a disintegration of such space with extra-personal, visual space. This being so, the 'OBE's as produced spontaneously by neuropathologies of this region, or induced by electrical stimulation, always appear to be partial and not fully reproduce OBEs as part of NDE phenomenology. The reason for this is likely that they, especially this latter, crude method, will not replicate the more wholistic neural activity of the TPJ, in synergy with other networks, which could then mediate the broader, more complex content of the NDE-OBE (Michael, 2021b). Such neural processes may still be a necessary correlate (vs cause) of the OBEs, even if they are veridical OBEs.

The encounter with the deceased, though one of the commonest NDE features, was almost fully absent from DMT. This discrepancy being related to the unique suggestion effects of being near-death may be unlikely, given the lack of awareness of most NDE subjects in Cassol et al.'s (2018) narratives (and in Van Lommel, 2002) of their dying/being dead. The fact of NDEs with and *without* such intimations of real death being phenomenologically the same (Charland-Verville et al., 2014) also supports this – though, the content, wherein details of meetings with the dead would lie, may well be different. However, unconscious awareness and interoceptive signalling of proximity to death could still introduce suggestion to influence content. That the dead often serve to return the individual from their NDE, and not in DMT, is particularly difficult to reduce neurally – though, folk explanations of ancient peoples upon individuals' recovery from apparent death may have included 'it not being time' (as is the typical message received) and being sent back by ancestors (Shushan, 2018). Thus, a sociocultural account of this could involve the propagation of this particular meme. However, lack of personal knowledge of this by most challenges such a model.

Li et al. (2015) identified not only a seemingly orchestrated release of a host of neurotransmitters, as well as global, coherent gamma activity upon rodent cardiac arrest – but also a complex cortico-cardiac signaling cascade which indicates that such physiological activity may function to preserve the organism, until a point at which the preservation of function is irretrievable and permanent death is imminent, whereupon the cortex signals to the cardiac tissue to cease functioning, and thus accelerating death. A correlation may be

easily made between this cortico-cardiac signal representing a biological ‘point of no return’, and the ‘threshold of no return’ manifesting imagetically or symbolically often as a gate or a wall, which is quintessentially experienced in the NDE – and entirely absent in the DMT space (and the feature scored lowest in DMT vs NDEs in Timmermann et al., 2018). The idea of this coordinated physiological protocol at death being a conserved evolutionary process is also echoed by Peinkhofer et al.'s (2021) positing of NDEs deriving from the more phylogenetically basic behavior of thanatosis (death feigning), which, like NDEs, may serve an adaptive survival function. It is characterised by muscular tonic immobility, and Unresponsiveness to yet maintained awareness of environmental stimuli, and given its induction in scenarios without biological insult could help explain NDEs without such impairment (‘fear-death experiences’). However, human thanatosis is still speculative, and the source and purpose, in this framework, of the (rich, profound) phenomenology associated with NDEs cannot be neurally accounted for by such immobile unresponsiveness. This said, the psychological threat of death (less than the thanatosis process itself) may be sufficient to reproduce the basic features of an NDE (Charland-Verville et al., 2014), where NDEs derived from only *perceived* threat to life may be more undergirded by psychological processes such as fantasy proneness (Martial et al., 2018) – though even in such fear-death scenarios neural operations may still be in play, in which they predict likely impending damage to the organism and represent pre-emptive protective mechanisms (Strubelt & Maas, 2008). Additionally, given that the feature of threshold or distinct return is, though unique to NDEs, only fairly common in them (see Chapter 5, Prevalence analysis, including Appendix C, 2.), this may imply that only the deeper NDEs, associated with those with greater death proximity, have this element – but future work should explore this correlation.

The existence of this imagery of a threshold is important to explain, given its highlighting that the near-death experience exhibits a clear narrative arc which ends with a specific, appropriate scene. How does the NDE ‘know’ how to end? Another hypothesis to the above, is one involving a retrospective model, in which during the phase where the brain is coming back ‘online’ after a deeply compromised or flatlined state, the period of neural inactivity resulting in reactivation, including of consciousness, provides the basis for psychological process to incorporate the fact that an ending has indeed occurred (compared to, for

instance, the above model where the NDE occurs prior to flatline, in the ‘shutting down’ phase). As such, symbolic imagery is able to be developed, post-hoc, to be consistent with the loss and then revival of consciousness. A different theory altogether involves that of ‘criticality’, a point at the higher end of a zone (super-criticality) defined by level of neural entropy – where normal consciousness resides in the centre, and psychedelics lead the brain into a more super-critical position (Carhart-Harris et al., 2014; 2018). In this way, with the near-death experience being characterized as a state toward super-criticality (Carhart-Harris et al., 2014), neural entropy as the brain becomes increasingly disorganized may elevate until a point of maximal entropy and experiential richness, beyond which consciousness can no longer be supported. This mirrors the narrative development of the NDE itself, where the intensity (associated with neural entropy) of the NDE is often reported to crescendo to such a final experience of ultimate light, akin to a peak mystical state, which is synonymous with, or just beyond, the appearance of a threshold. This threshold, then, represents, in a similarly symbolic way to the above speculations (and like the proposed visualisations of the DMN disintegrations in Chapter 7), the moment beyond which death, the annihilation of consciousness, would occur.

The lack of the explicit disintegration of self-defining networks, such as the DMN, as well as greater activity across areas including DMN nodes in the near-death or death state (PFC: Beauregard et al., 2009; e.g. Auyong et al., 2010; Chawla et al., 2009) compared to, for instance, DMT (Timmermann, 2019), may account for the virtual absence of ego dissolution in the NDE compared to its prominence in DMT. Additionally, the core mystical experience is known to be optimised with greater structure to the set and setting around the psychedelic experience (Sepeda et al., 2019), where the NDE is typically unexpected and spontaneous versus the prior and *in situ* preparative opportunity for the DMT participants.

Lastly, in contrast to all the previous, the rate of feeling as if one was dying is very comparable between the DMT and NDE states – which is interesting, given that indeed the DMT subjects are *not* near-death. There may be physiological effects such as the ‘rush’ and its stress-like sympathetic action, or the presence of DMT itself mistaken for endogenous DMT, artefactually signalling a near-death state to the central nervous system – and the choking on the inhaled smoke, as well as the profound ego death induced, could well serve as psychological suggestions as to the participants’ proximity to real dying). As such, DMT

may be just as well positioned as typical NDEs to introduce a suggestion of dying and thus manifest death/NDE-pertaining content. While this evidently did not largely occur owing to the fundamental content differences highlighted in this analysis, it is of note that all the NDE-like DMT cases (presented above) included sensations of dying (while not all cases involving this sensation lead to NDE-like experiences).

Neurodelia: Psychedelic neuroscience

As previous discussed (e.g. Chapter 5), similarities between DMT and NDEs need not assume the release of endogenous DMT in the latter. Overlapping neural activity, on a less neurochemical and more gross network level, may also account for this. As such – in paralleling the psychedelic and NDE state – surveying the most recent developments in the neuroscience of psychedelics should be importantly instructive in the understanding of what the neural correlates of the NDE may be (given the greater difficulty in directly neuroimaging the near-death experience). Several review articles have scoped the psychedelic neuroscience literature (Barrett & Griffiths, 2018; Yaden et al., 2021; Vollenweider & Smallridge, 2022), and this can be comprehensively, though succinctly, summarised as encompassing:

f/MRI

Deactivation of the Default Mode Network (DMN), including the mPFC, PCC, Parahippocampus, and Angular gyrus/iPL (*Psilocybin, LSD*: Carhart-Harris et al., 2012, 2016; *Psilocybin*: Tagliazucchi et al., 2014)

Decrease in activity and connectivity within neural networks, and between (normally connected) networks, i.e. reduced modularity, and decoupling, particularly in DMN (*Psilocybin*: Carhart-Harris et al., 2012, 2013; Muthukumaraswamy et al., 2013; Smigielski et al., 2019; *Ayahuasca*: Palhano-Fontes et al., 2015; *LSD*: Carhart-Harris et al., 2016; Speth et al., 2016; Lebedev et al., 2015; *DMT*, Central Executive Network: Timmermann, 2019)

EEG

Reduced low frequency/alpha oscillations (*Psilocybin, LSD*: Muthukumaraswamy et al, 2013; *Psilocybin*: Komater et al, 2015; Tagliazucchi et al, 2014; *Ayahuasca*: Riba et al, 2002; Riba et

al, 2004; Schenberg et al, 2015; Kometer et al, 2013; *DMT*: Timmermann et al, 2019, Pallavicini et al, 2020; Acosta-Urquidi, 2015)

Increased very low frequency/theta & delta oscillations (*Psilocybin*: Kometer et al, 2015; *DMT*: Timmermann, 2019; Pallavicini et al., 2020; Acosta-Urquidi, 2015)

Increased high frequency/gamma (*Psilocybin*: Kometer et al., 2015; *Ayahuasca*: Schenberg et al., 2015; *DMT*: Pallavicini et al., 2020; Acosta-Urquidi, 2015)

Reydellet et al. (2022) showed in the *DMT* state: i) global alpha suppression, likely related to sensory prediction reductions and concomitant sensory disinhibition; ii) low gamma increase over *occipital* cortex, consistent with vipasana and mindfulness meditators; iii) global desynchronisation (with concomitant alpha decrease, gamma increase), similarly to 'ii)' relatable to top-down disruption; iv) theta and alpha band connectivity decreases.

Other measures

Increased brain entropy, or proxy measures such as signal diversity, Lempel-Ziv complexity, or connectivity repertoire (*Psilocybin*: Carhart-Harris et al., 2014, 2018; Lebedev et al., 2015; Tagliazucchi et al., 2014; *LSD*: Lebedev et al., 2016; Herzog et al., 2020; Schartner et al., 2017; Atasoy et al., 2017; *Ayahuasca*: Viol et al., 2017; *DMT*: Timmermann, 2019)

Reduced weighting of priors/top-down information flow, and liberated prediction error/bottom-up information (Carhart-Harris & Friston, 2019; *DMT*: *Alamia* et al., 2020)

Reydellet et al. (2022) show, in the *DMT* state, the majority of entropy elevations as over the *occipital* and *temporal* areas, likely accounting for vivid, immersive hallucinations

Taken all together, the most robustly identified correlates of the psychedelic state, which weaves together a connected neural system, would include – a disintegration of intrinsic, *resting-state networks*, namely the DMN; diminishment in *alpha oscillations*, which are prevalent across the PCC, a key node of the DMN; and *elevation in entropy* and analogous constructs, which are liberated upon the release of inhibitive networks (e.g. DMN) and oscillations (e.g. alpha). The sometimes found increases in theta, however, may be more specific to *DMT*. Supporting this, the most salient differences between *DMT* and other classical psychedelics appears to be the low frequency increases, associated with the immersive state (Timmermann, 2022) (however, this may be artefactual of non-comparable

dosages, where e.g. high-dose psilocybin's similarly immersive state, yet to be neurally measured, may also show such low frequencies). The sometimes found increases in gamma may also be likelier in DMT (given the many more ayahuasca studies only yielding one with significant gamma effects). Additionally, an important, overarching neural correlate of the psychedelic state seems to reside in connectivity decreased between low level (e.g. primary sensory) networks, and connectivity increases between high level (e.g. association, meaning making) networks (Timmermann, 2022).

On account of phenomenological comparability between psychedelics and NDEs, then, such core psychedelic neural correlates may transpose well onto the NDE state – however, of course, the not insignificant experiential differences between the two states may also mean such correlates to be, in some significant way, different – as explored in the following section.

Near-death neuroscience – and its overlap with psychedelic neuroscience

No imaging studies have been conducted during the unfolding of an NDE, however several studies have involved a hypnotic regression of participants who have experienced an NDE into an NDE-like state. Palmieri et al. (2014) have hypnotically regressed NDErs to revivify their NDE memories while employing EEG, and identified an elevation of the slow-wave theta and delta bands. This appears to be consistent with all three EEG analyses of DMT to date (Acosta-Urquidi, 2015; Pallavicini et al., 2020), and has been specifically associated with the DMT breakthrough (Timmermann et al., 2019). The dimension of 'spiritual experience' and insight on psilocybin is also correlated with theta activity (Kometer et al., 2015). Martial et al. (2019) has also hypno-regressed NDE subjects into their past NDE state – however, finding increased (fronto-posterior) alpha power, which strikingly contrasts to the attenuated alpha characteristic of psychedelics, and may be owing to the very small sample of n=5, constituting instead a proof-of-concept study.

Beauregard et al. (2009) performed EEG and fMRI on near-death experiencers as they meditated in order to connect with the being of light whom they encountered in their NDE – which, given the lack of rigorous use of trained hypnotic regression therapists to amplify NDE recall (as in the previous studies), may be less methodologically sound. They did

identify, however, elevations in (fronto-temporal) theta, echoing DMT (Acosta-Urquidi, 2015; Pallavicini et al., 2020, Timmermann et al., 2019), and to a degree psilocybin (Kometer et al., 2015) – as well as (fronto-temporal) gamma, which echoes DMT (Acosta-Urquidi, 2015; Pallavicini et al., 2020) and, to an extent, ayahuasca (Schenberg et al., 2015) and psilocybin (Kometer et al., 2015). In this way, it is of significant note that the few EEG studies on NDEs appear to be most consistent with the neural correlates of DMT in particular, mainly in terms of the increased theta, but also increased gamma. As such, the comparability, though limited, of the qualitative content – but the near-identical nature of the phenomenological structure, which is intrinsically connected to neural structures/activity – between NDEs and the DMT state may be corroborated on this neural level, given this more substantial overlap with DMT versus other psychedelics.

Beauregard et al. (2009) also identified greater activation in the medial Prefrontal Cortex (mPFC), orbitofrontal, (anterior, inferior) temporal cortices, and parahippocampus – where, although more recent imaging seems to have confirmed decreases in regional activity, especially in networks such as the DMN, to be more characteristic of the psychedelic state, Vollenweider et al. (1997) did show increased mPFC activity. Amplifications in activity of the hippocampal complex (including medial temporal lobe; mTL) are also a key signature of psychedelic action, owing to release of its top-down constraints (Carhart-Harris, 2007, 2018; Carhart-Harris et al., 2014) – where, again, DMT exhibited enhanced activity over the temporal lobe (regarding theta power) which may be driven by mTL excitation (Timmermann, 2019).

Theoretical neural correlates of NDEs – and overlap with psychedelic correlates

Martial et al. (2020) has constructed an instructive graphic to denote the key neural processes, which may be putative given the lack of direct NDE imaging yet based on robust data, which may account for the near-death experience and its myriad features. This, however, is limited, and so an adapted version is reproduced below (Figure 7) with further likely candidates of neural correlates to create a more comprehensive and sophisticated picture – which can be considered a novel, integrative neural model of the NDE. Such a multivariate model should be illuminative of the fact that, as emphasised throughout, the origin of the NDE (at least neurally) is exceptionally more complex than putative DMT

release alone, and thus represents the most salient foundation for explaining the evident discontinuities between the content of DMT and NDEs.

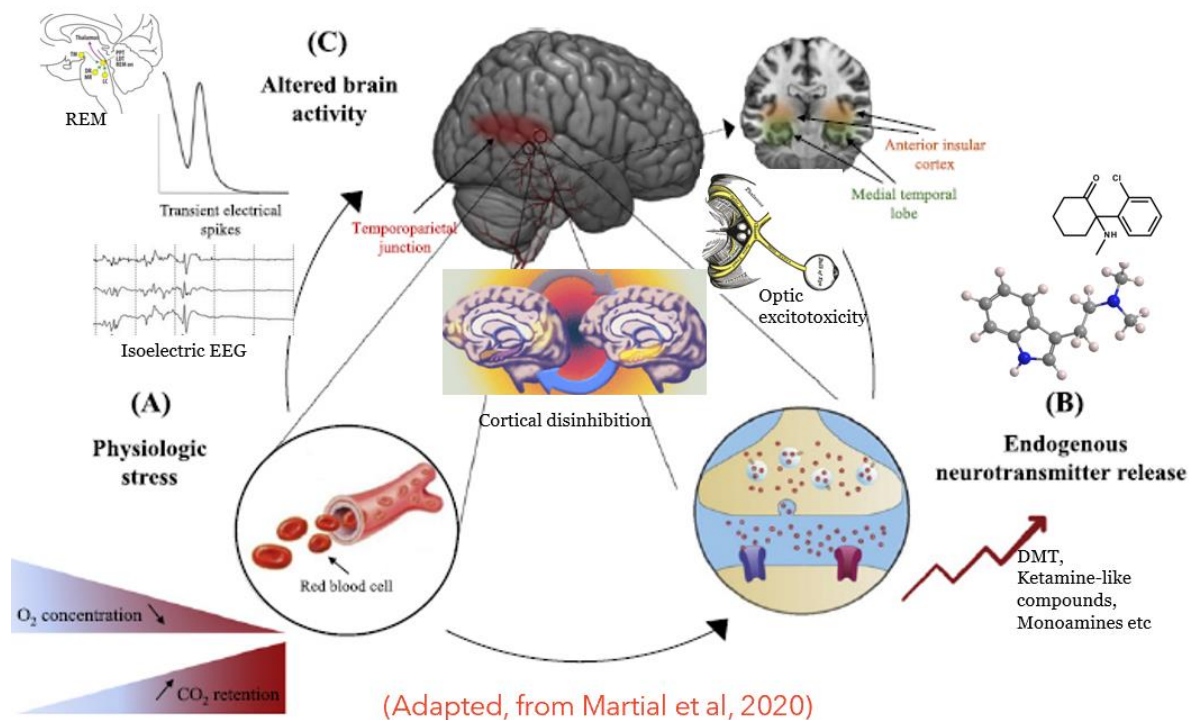


Figure 7: Integrative, interactive neural model of the near-death experience (adapted from Martial et al, 2020), incorporating novel additions, including more comprehensive account of neurotransmitter release (DMT, monoamines) and of brain activity (cortical disinhibition, optic excitotoxicity, REM, isoelectric EEG)

Global phenomenology

Some components of the above model can be considered to help account for the *global phenomenology* of the NDE, that is, which need not account for specific phenomenological elements but may be crucial initial instigators of a subsequent cascade of neural events, or which themselves are capable of generating the experience in large part, including immersion into other worlds or the mystical state. These would encompass those included in the original model (Martial et al., 2020), such as the most patently implicated hypoxia and hypercapnia, given the near-death conditions; interruption of the TPJ, which is involved in dream world generation (Scarpelli et al., 2019) and consciousness itself given its enacting fundamental neural integration (Koch, 2019); and release of ketamine-like chemicals, where the neuroprotective, NMDA receptor antagonists N-acetyl-aspartyl-glutamate (NAAG),

kynurenic acid, magnesium (K. L. R. Jansen, 2004), and particularly agmatine (Thomas, 2004) are possible candidates.

Those components added to the model include REM dreaming activity (and associated hypersensitive arousal system), where NDEs were significantly more likely to exhibit REM intrusion symptoms (Nelson et al., 2006) and those experiencing REM intrusion were significantly likelier to report NDEs (Kondziella et al., 2019); migraine aura, also found to be a significant predictor of NDEs, where a transient form of spreading depolarisation, the process considered the final signal of irreversible brain death, may be part of the pathophysiology of migraine aura (Kondziella et al., 2019); cortical disinhibition, on account of hypoxic disabling of higher-order inhibitive networks, causing unconstrained intrinsic activity – in the same vein as that discussed in Chapter 6 as an alternative account for Alexander’s NDE versus 5MeO-DMT; and that which is most salient as per the present thesis’ comparison with NDEs, i.e., release of endogenous DMT (Dean et al., 2019; Timmermann et al., 2018), though theoretically may also incorporate other endogenous psychedelics such as 5MeO-DMT, or bufotenine (Barker et al., 2012). Serotonin was also immensely upregulated (over 200x baseline) in rat cardiac arrest (Li et al., 2015), and if its supposed psychedelic properties are replicated (Schmid & Bohn, 2010) could similarly elicit much of the NDE’s global phenomenology. Li et al also describes the upregulation of a multitude of other substances (elaborated below) which also includes acetylcholine, whose antagonism is effected by deliriant, in turn associated with *non*-lucid dreaming, versus the maintained reality-testing (though retained conviction in the reality) of NDEs (and which is a neurotransmissional target of Alzheimer’s medication and oneirogenic substances for dream lucidity, due to its centrality in memory processes, linking to NDE’s lifelong recollectability, Greyson, 2007). Dynorphin, the endogenous ligand to the kappa opioid receptor, in turn the receptor which salvanorin A, the psychoactive chemical in *salvia divinorum*, agonises, could also contribute to the NDE. This is in light of the receptor’s mediation of dissociative hallucinatory effects – likely due to dysconnectivity within the DMN and claustrum (Doss et al., 2020; Stiefel et al., 2014) – analgesic as well as neuroprotective effects (Nichols, 2018), and the phenomenological finding of salvia’s significant mimicry of the NDE (Martial et al., 2019b). However, the kappa receptor is also key in mediating dysphoria, so may contribute to the likely under-reported distressing NDEs – and its mimesis of NDEs is questionable

given its floridly bizarre and unforgiving phenomenology, at least when smoked versus chewed (Allit, 2022), and may be an artefact of convictions of dying when users mistake the substance for cannabis (Martial et al., 2019b). Lastly, while not explicitly included in the model above, owing to the as yet unestablished active effects which neural oscillations exert on the brain and thus contribute to conscious experience – as discussed at length above, theta oscillations may also be significantly implicated in NDEs (Beauregard et al., 2009; Palmieri et al., 2014); and as discussed below, gamma oscillations may also be, given their being robustly evidenced not near-death, but at death both animal models and human beings, e.g. Borjigin et al., 2013; Chawla et al., 2009). Another important wholistic, neural model of the NDE by Kondziella (2020) does encompass the herein added REM intrusion, migraine aura, as well as thanatosis (see above).

Finally, one leading unified theory of consciousness, integrated information theory (IIT; Tononi, 2004) makes the startling prediction that conscious experience may depend not only on active, but inactive/silent neurons, and even under conditions of a fully inactive/silent brain conscious experience is still possible (Bartlett, 2022). As such, a silent brain, albeit one whose neurons are not fully inactivated/disabled, during any phase of the dying process may still accommodate the generation of an NDE, where recourse to a transcendentalist interpretation may not be necessary. This prediction parallels the neuroelectric silence in the brain under ketamine being connected with the unique state of unconsciousness-like consciousness below (Nicol & Morton, 2020), yet consciousness-supporting silent neurons are predicted to not dissimilarly facilitate another unique conscious experience of emptiness, aligned with the mystical state. Tononi (2012), in explaining IIT and such predictions through a fantasised dialogue between “Frick” and “The Frenchman”, writes:

“...if your soul is immortal, what happens when your brain is dead? Will you be awake or asleep? Will you have the pleasure of sight? And in that case, what will you see?... For if you had a soul without a brain, *it would have to be empty.*”

“I will be *clear*”, said the Frenchman, “I will be conscious of my *soul’s oneness with God*”

“Why not of your soul’s...*intercourse with nothingness?*” Snarled Frick... “And even so, what kind of oneness with God would it be, if it cannot be experienced, or remembered?” (Tononi, 2012, p. 112, *my italics*)

Indeed, Koch (2022) himself, a co-author with Tononi and proponent of IIT (e.g. Tononi et al., 2016) reported a near-death experience of his own, a non-dual encounter with the light, classically evocative of the *myserium tremendum et fascinans*, to demonstrate the repertoire of possible conscious states, which under such frameworks as offered by IIT may be illuminated:

“A blazing point of pure, white light of unbearable intensity, without the conceivability of looking away, as there is no away from. There is no space. Everything is contained in a point of pure energy. There are no other visuals, no colour, no motion, no texture, no depth, neither sound nor silence, neither pleasure nor pain, no feeling of a body, no self, no ego, no memories, no desire, nether hope nor fear. No sensation of the experience being too brief or too long, of wanting it to end. There is no time. There is only terror and ecstasy. That, and the icy bright light.”

Specific phenomenology

In respect to components of the above proposed integrative model that are positioned to account for *specific* phenomenological elements of the NDE, this resembles a piecemeal attempt to stitch together the multifaceted tapestry of the near-death experience with discrete, undergirding neural processes. Such components already included in the original model may involve the mTL, including the hippocampus and amygdala, which could account for the revivification of autobiographic memory (the life review) and profound emotional valence; the TPJ, again, which may account for the OBE (Blanke et al., 2004, 2015), and the sense of presence and hyperempathic resonance owing to its implication in theory of mind (Aichhorn et al., 2009; Frith & Frith, 2000); the (anterior) insula cortex, which is similarly as intricately multifunctional as the TPJ, and may itself predicate self-consciousness given its role in integrating interoceptive states and contextualising feelings (Damasio, 2021) – where it may account for feelings of empathy or compassion (Singer, 2006), bliss sensations such as those inherent to ecstatic seizures of the insula (Bartolomei et al., 2019), subjective insight or the noetic experience given its interruption producing mismatching between

predicted and actual internal states thus causing emotional certainty (Picard, 2013); and endorphin release may similarly account for bliss states and analgesia, where higher endorphin concentrations have been shown after myocardial infarction and heart failure (Oldroyd et al., 1992) and its antagonism by naloxone was correlated with inducing distressing NDEs (Judson & Wiltshaw, 1983).

To reiterate, structural differences are likelier to be neurally linked, while content differences may be more subjectively mediated. But this said, *neuropsychological* models inevitably show greatest explanatory power, where both are appropriately combined. With this in mind, in terms of components of the model which have been added to the original – Disinhibition of optic tract neurons and resultant excitotoxicity, as theorised by (Blackmore, 1996) and supported by optic ischemic injury in cardiac arrest survivors (Blanke et al., 2015), may account for the perception of a growing and approaching light amidst darkness generating a tunnel effect; the cortical flatlining which may occur in some NDE circumstances (though rarely evidenced, and not linkable to the unknown timing of the NDE e.g. Pam Reynolds, in French, 2005), has analogously been evidenced with transient isoelectric EEG after ketamine administration in sheep (Nicol & Morton, 2020), where the authors connect this to the users' state of oblivion (the 'K hole'), and may thus account for the immersion in a void (Cassol et al., 2019); finally, the aforementioned immense elevation of a plethora of neurotransmitters (at least in rodent death) includes, for instance, noradrenaline and dopamine – which carry various functions such as attention and salience and memory consolidation (Cahill & Alkire, 2003), and so may account for the intense lucidity, meaning and memorability of the NDE – as well as histamine and GABA, which are centrally implicated in alertness and sedation, respectively, thus likely relating to NDE's hyper-lucidity and peacefulness (Distressing NDEs have been linked to infratentorial lesioning, Charland-Verville et al, 2015, and may also be promoted by the disturbed 'set' of the dying e.g. in suicide, Cassol et al, 2019).

Crucially, as stipulated in the original model (Martial et al., 2020), the simplified tripartite effects of tissue stress (A), transmitter release (B) and brain activity (C) act, intuitively, in a complex, non-linear and interactive fashion. That is, while A may be the fundamental, initial physiological change near-death, it may then cause B, which may in turn lead to elements of C. However, A can directly lead to C, and both A and B together can lead to C. For instance,

anoxia may cause discharges in the limbic system directly, but this may be modulated or exacerbated by endorphin release which may reduce the seizure threshold (Frenk et al., 1978). This echoes the theories below where DMT may interact with imagery produced by optic disinhibition (see section iii.), or the compromised brain may influence DMT's effectivity (see Future Research). Importantly too, the hypothetical progression of the disparate neural events across seconds and minutes, could be a pivotal basis for the syndrome of the NDE which may follow an approximate sequence. For example, though Martial et al. (2017) found no strictly adhered to chronology to NDE features, a rough order of their appearance did include beginning with the shallower of elements such as peace, then light, then followed by the more complex or iconic of components like spirits or people (denoting entry into another space), and logically ending with the border and return. As such, initial anoxia may stimulate areas such as the insula or lead to optic hyperexcitation, generating bliss and light (and tunnel) respectively, Subsequent release of transmitters, especially DMT or serotonin (acting upon the 5HT-2A receptor where psychedelics exert their effects), which may begin at 1 minute post cardiac arrest but continue for many minutes (Li et al., 2015), may be the foundation of the iconic, otherworldly encounters, analogous to the so-called 'breakthrough' of DMT experiences. And different speculations as to terminal cortico-cardiac signalling or neural criticality – as discussed above – could relate to the ultimate threshold encountered.

Psychedelic neural overlap

As regards the overlap of these possible mechanisms of the NDE with the psychedelic state – naturally, the release of DMT/5MeO/bufotenine or endogenous ketamine analogues (or dynorphin, or possibly serotonin) make a direct connection. However, in terms of overlap with the broader neural correlates of the psychedelic state, and thus offering further substantiation of their neural, as well as phenomenological, parity – greater global integration has been found in the TPJ and insula under LSD (Tagliazucchi et al., 2016); neural activity reminiscent of REM dreaming, especially temporal, is a key signature of the psychedelic state (Carhart-Harris, 2007), where (lucid) dream reports are most comparable to NDE narratives (Sanz et al., 2018); cortical disinhibition, or the dismantling of higher networks and concomitant increase in neural complexity, which may include intrinsic activity such as from mTL regions, is, again, a core feature of psychedelic activity (Carhart-

Harris & Friston, 2019; Carhart-Harris, 2018; Carhart-Harris et al., 2014); as mentioned, the possible flatlining of the brain near-death mirrors the transient isoelectric EEG found under the dissociative anaesthetic ketamine, a non-classical psychedelic (Nicol & Morton, 2020); beta-endorphin itself, as well as cortisol, though not psychedelic, have been shown to be released after DMT administration (Strassman & Qualls, 1994). The resonance between, mainly, the theta and gamma frequency band prominence of both the near-death and psychedelic (largely DMT) state was discussed at length above.

Table 8: Putative neural correlates of the near-death experience, accounting for either global or specific features of the phenomenology. Blue indicates novel additions to the original model (proposed by Martial et al, 2020); single stars indicate partial evidence for neural overlap with the psychedelic state, double stars indicate strong evidence for neural overlap with the psychedelic state

Neural correlates of NDE – Global phenomenology i.e. ‘Breakthrough’, Other worlds/encounters, Mystical experience	Neural correlates of NDE – Specific phenomenology	Examples of specific phenomenology
< O2, > CO2		
*TPJ	TPJ	OBE, Life review/hyperempathic resonance, Entity encounter
**Ketamine-like chemicals		

**REM activity		
*Migraine aura		
**Cortical disinhibition		
**DMT/Bufotenine/5MeO		
**Serotonin (other monoamines & NTs)		
**Dynorphin		
**Theta/Gamma oscillations		
	**mTL	Emotion, Life review
	*Insula	Empathy, Ecstasy, Noetic experience
	*Endorphin	Peace/bliss
	Optic tract hypoxia	Light, Tunnel
	*Isoelectric EEG / Inactive neurons	Void; Mystical state
	*Nor/adrenaline	Lucidity, Recall

Neurobiology of canonical death – Human

Though permanent death is distinct from the near-death state, and the neurobiology thereof will be different – where by definition the neural activity of the former is correspondent to irreversible changes to the brain – it is still crucially instructive for inferring the likely neural mediation of experiences *near-death* (especially given data is more easily gathered in these cases). The timing of the NDEs is mostly impossible to identify, except perhaps with veridical OBEs where correspondence can be made with surrounding activity, as attempted in one instance by Parnia et al, 2014 – though see Michael (2021) mentioning its possible nature as ‘perspectival precognition’, i.e. remote viewing projected into the future. Despite this timing problem, some theorists argue NDEs’ occurrence at a time of neural dysfunction or (presumed) electrocortical silence demonstrate the NDE’s veracity. However, as the following literature suggests, the brain near- and at death still evidences specific forms of activity, some of which may be capable of producing, transient,

sophisticated neural processes indexing of rich conscious experience (yet, again, timing of the NDE has yet to be located to these events either). Firstly, although the subjects in Clute & Levy's (1990) study of surgical implantation of automatic internal cardioverting defibrillators (AIDCs) involved temporary cardiac arrest and brain hypoxia (not permanently dying), they found 10 seconds post-arrest, attenuation in the alpha band and EEG slowing (in 82% arrest events), theta increase (in 11%), and delta loss (in 7%). Kroeger et al. (2013), again while not during irreversible death but during the deepest levels of coma, identified in humans (and cats, with intracranial recording) hippocampal ripple activity and quasi-rhythmic sharp waves (Nu-complexes), with the rippling being sourced as travelling from the hippocampus to the cortex. Such activity could have implications for the resurfacing of episodic memories into consciousness, i.e. in the life review.

The remaining studies entailed recording during withdrawal of life support. Norton et al. (2017) identified using subhairline EEG, a post-cardiac arrest finding of cerebral inactivity preceding heart-beat/blood pressure loss, though with ¼ of patients exhibiting delta bursts after blood pressure loss. Dreier et al. (2018), using subdural or intraparenchymal electrodes, reported isoelectric ECoG during the fall of blood pressure, but with a terminal spreading depolarisation 10 seconds–4 minutes directly after this, up to 4 minutes post-blood pressure loss. Comparably, (though not by support withdrawal), Carlson et al. (2019) also reports in a case study of subarachnoid haemorrhage that progressive hypoxia over a series of days was associated with terminal spreading depolarisation, eventually leading to cortical silence, then long depolarisation, and finally brain death. This unique appearance of hypoxic depolarisation *prior* to initial silencing is owing to the longer-term neurological disorder. Most centrally regarding activity possibly indicative of conscious awareness, and again during life support withdrawal – using Bispectral Index (BIS; or SEDLine) measures, over the frontal cortex, Chawla et al. (2009) revealed at blood pressure loss a decline in activity, then followed by transient high-frequency spiking, importantly consistent with normal consciousness, as well as burst suppression. Auyong et al. (2010), similarly, reported in conditions of organ donation after cardiac death (DaCD) including anaesthetic administration, and in cases of support withdrawal not using anaesthetics (and thus not an artefact of these agents), that BIS values also showed, effect of immediately, activity consistent with light anaesthesia. Chawla et al. (2017) illustrated that during the clinical

death of critically ill patients, none of those diagnosed as brain dead exhibited end of life electrical surges (ELES), but 50% of the remaining did show these, which were characterised as high-frequency with a mean peak patient state index (PSI) of 59+-26, where importantly over 50 signifies emergence from anaesthesia.

Finally, Vicente et al. (2022) seems unique in reporting the only case of continuous EEG (vs the rudimentary, frontally-placed BIS/SEDline) in the dying human brain in acute clinical vs chronic intensive care settings. They identified not dissimilar results as the previous literature, including the post-cardiac arrest enhancement in narrow and broadband gamma power, although decreases in theta were observed. Relative preservation of gamma vs other frequencies was also shown, however, as well as cross-frequency coupling between the gamma and alpha rhythms (and to a lesser degree theta). Given the modulation of gamma by alpha being linked to the recall of memories, the authors suggest this activity's appearance to account for the 'life review' feature characteristic of some NDEs.

Neurobiology of canonical death – Rodent

Neural recordings of the dying process have also been conducted in rodent models. Naturally, there are translational issues with extrapolating from rodents to humans, but data is generally richer given the more sophisticated techniques able to be employed, such as intracortical transmitter assays, impossible in humans, and higher density EEG vs. BIS monitoring. As discussed above, in terms of neurotransmitter activity, Li et al. (2015) evidenced that asphyxia in rats induces a 'brainstorm' of neurotransmitter release. In the first minute alone, focusing on the monoamines and excitatory transmitters, noradrenaline was elevated 30x baseline concentrations, serotonin 20x, and dopamine 12x, and glutamate up to 3x. Regarding correlations with psychedelic action, the former three are the systems upon which the tryptamine and phenethylamine psychedelics act, and the latter on which the non-classical ketamine acts. At up to 4 minutes, however, many transmitters continued to rise dramatically, including serotonin rising to 250x baseline levels, which is the system by which classical psychedelics have their effects (specifically, 5HT-2A receptors). Dean et al. (2019) also demonstrated elevations of endogenous DMT at a mean of 6x baseline levels in rat cardiac arrest.

In reference to EEG studies on rodent models – van Rijn et al. (2011) evidenced, after decapitation, an exponential, global loss of beta and gamma (i.e. high frequency oscillations linked to cognition) within 4 seconds, but where the burst suppression associated with anaesthesia becoming normalised (i.e. equivalent to awake rodents, with possible regaining of consciousness), and at approx. 1 minute post-decapitation, a high amplitude slow wave occurred. This was followed by overall lowering of power. Borjigin et al. (2013) showed that transient, global, coherent and synchronous gamma activity transpired within 30 seconds post-cardiac arrest, followed by an isoelectric state. This gamma activity was of high amplitude in the low gamma range, which contrasted to the anaesthetised state – and was also characterised by an increase in anterior-posterior directed connectivity, and its phase-coupling to theta & alpha. This echoes comparable phase-coupling with gamma to alpha (and theta), identified in the dying human brain (Vicente et al., 2022). Borjigin et al highlight that such neurophysiological activity exceeds that of the waking state. Lee et al. (2017) showed, using electrocorticographic recordings (ECoG), the post-asphyxia/pre-cardiac arrest occurrence of left-right frontal coherence (mirroring the coherence of Borjigin et al., 2013), and posterior/occipital power increase within seconds, followed by isoelectricity within 1 minute. Finally, Zhang et al. (2019) demonstrated, after chloral hydrate (ChHy)-induced death, specifically recording from the hippocampus – elevations in beta activity, where increase in gamma were localised to the CA1 region and specific to lethal doses i.e. eventual death, as well as inter-hippocampal high-frequency coherence (which mirrors the coherence of Borjigin et al., 2013; Lee et al., 2017, and the hippocampal sharp waves in humans above, Kroeger et al., 2013), and suppression of theta power and coherence. Importantly, this activity preceded ultimate cardiac arrest whereupon final isoelectricity occurred, implying both that the timing of any conscious experience (e.g. NDEs) may occur prior to cardiac cessation, and that such activity may not be unique to the cardiac arrest mode of death, where consciousness (including NDEs) could occur in near-death states not due to cardiac arrest (but other neural impairment).

In comparing both the above data on human and rodent death – dominance of high frequency activity, namely gamma, appears very consistent amongst the human research, and largely consistent among rodent research. Dominance of slow wave activity, mainly theta, seems moderately evident across human research, though only suggested in one

rodent report (van Rijn et al., 2011). Loss of gamma, however, was identified in van Rijn et al. (2011), and loss of theta was shown by Zhang et al. (2019), which may (speculatively) be related to the mode of death involving decapitation and ChHy respectively. Lastly, the congruence these human and rodent studies exhibit with psychedelic neural recordings encompasses the elevations in theta (*Psilocybin*: Kometer et al., 2015; *DMT*: Timmermann, 2019; Pallavicini et al., 2020; Acosta-Urquidi, 2015) and gamma (*Psilocybin*: Kometer et al., 2015; *Ayahuasca*: Schenberg et al., 2015; *DMT*: Pallavicini et al., 2020; Acosta-Urquidi, 2015). While the more established psychedelic neural correlates of diminished alpha, heightened entropy and DMN disintegration were not demonstrated – these latter two have not as yet been measured in the dying human or rodent brain.

Computational neuroscience of psychedelics – Relevance for the NDE

The central conclusion of the present thesis that the qualitative content is markedly different between the NDE and DMT experience, including the above discussed idea of the quintessentially ‘alien’ (i.e. unfamiliar, despite the subjective sense of familiarity) content of DMT, versus the NDE perhaps, in one sense, being more personal in content, can also be illuminated by applying the predictive processing framework. Where the universality of the basic features of each can be owing to neural underpinnings (in a bottom-up manner), top-down mechanisms can contribute to the subjective content of what is perceived. With sensory input disruption such as in the NDE (representing a state of disconnected consciousness, Martial et al., 2020), Blackmore (1993, 1996b), for instance, relates the brain’s reliance on its internal model of the environment to the perceptions in the ‘out of body’ state. This, though, is difficult to adopt in significant cases of veridical OBEs (see ‘Parapsychology’ below). Also observed is that whenever an entity is encountered (at least those attached to specific content, versus a sensed presence or ‘being of light’ which may make up most encounters e.g. Greyson, 2021), this is almost always congruent with the experiencer’s cultural heritage. This can similarly be applied to the above discussion on the tunnel effect, where a tunnel percept may be constructed based on prior expectations upon experiencing optic hyperexcitation.

Regarding predictive processing, Reydellet et al. (2022) show preliminary data of the DMT state suggesting a travelling of neural entropy between higher order/anterior and lower

order/posterior regions, possibly linked to a cognitive interpretation being applied to sensory content. If endogenous, classical psychedelics or neural activity consistent with their action plays a part in the near-death state, psychedelics' downweighting of the cortex's priors (the predictions helping construct one's internal model of the world) may also be operative in NDEs. This would mean the inability of the priors' to firmly instantiate themselves and outcompete alternative hypotheses of the cause of the spontaneous experience (and ambiguous information) of the psychedelic or NDE state, concomitant with the loss of both neural synchronisation and employment of inhibitory networks to suppress the prediction error or ascending activity. The continual attempts to minimise this uncertainty by the undermined priors leads to the top-down recruitment of such hypotheses, and thus the development of hallucinatory experience continuous with one's expectations. This being so, these priors/hypotheses are weakened and thus the cortex shifts in their activation, accounting for the unstable, morphing experiences with psychedelics – yet not explaining the largely established imagery in NDEs. At greater psychedelic doses, like DMT at breakthrough levels, stability is evidently manifested as an apparently novel world model is constructed, where the cortex may fall into new attractor basins. The DMT breakthrough, and associated, sudden experiential coherence, has been correlated with theta and delta oscillatory dominance (Timmermann et al., 2019), where a shift from the attempts of backward predictions to assert themselves toward forward error signals has also been evidenced (Alamia et al., 2020), which may signify such order arising from a novel attractor landscape (though the source of this is unknown). As such, similar processes may occur in the NDE state. That the NDE is also comparable to a lucid dream state (as outlined above) is also consistent with NDEs as having underweighted priors but preserved prediction error (sense data), where the insight or metacognition characteristic of lucidity may rely on these error's informing as to the untrustworthiness of the internal model (Gallimore, *personal communication*, 8th December 2020).

As per the failure of synchronisation, and thus of established priors, in the psychedelic state – this may not be the case for the near-death state, on account of the many reports suggesting synchronised gamma activity at death (as delineated above). Comparable to the new order and attractors (and presumably synchrony) of the DMT state, such synchronised

gamma at death could represent the neural basis of the stabilised visionary experience of the NDE.

Relevant to this, Shushan (2022) proposes a modified version of the below elaborated mind-dependent afterlife model suggested by other authors (Hick, 1976; Price, 1953), referred to as the 'projection model'. This is correspondent with Becker's (1993) study of Pure Land Buddhism involving spirits and the deceased being 'real' in the other world, where only details may be altered in one's perception of them, and Osis & Haraldsson's (1986) hypothesising that the other world of the NDE being an idealised Earth is a "symbolization" of the sensations of joy and peace felt. The projection model of the afterlife is described as one in which:

"the individual actually "projects" specific forms onto a general background structural experience. The generic otherworld features are "clothed" with coherent imagery by the psyche of the person having the experience... A person's stock of images, memories, creativity and ideas... [are] mentally projected onto the structural, thematic environment." (Shushan, 2022, p. 174)

In this way, a framework is developed to take into account the shared major themes across NDEs and the evident differing in surface manifestations between experiencers' reports – but one which aims to support the possibility of survival. However, that these observations appear to just as equally be subsumed by the above computational model may undermine such a proposed 'projection' model.

History of Religions

One pivotal, over-arching conclusion of the present thesis is that while the grosser thematic features of the DMT and NDE states are virtually identical, the way each of these were presented to the experiencers were characteristically different. This concept of an important delineation of at least two fundamental levels of experience, albeit employing different but corresponding terms, was ultimately the very same conclusion as Shushan (2009, 2018), historian of religions, conducting comparative analyses of the NDE phenomenon across ancient civilisations and indigenous societies – as was the conclusion of Levi-Strauss in comparing the mythologies of different cultures:

“Levi-Strauss used the term ‘mythemes’ to describe the thematic elements of a myth... [E]lements such as ascent [akin to the OBE], judgement [akin to the life review feature]...are mythemes... [C]ulture-specific details, which we may refer to simply as ‘symbols’... are expressed in mythemes” (Shushan, 2009)

In terms of considering ontological implications of these conclusions, in Shushan’s appraisal, the consistency of the mythemes – and by extrapolation of the features of either the NDE or DMT experience – represents a “core experience”, which is reliable and repeatable, and is thus likely evidential of an *objectivity* to the ‘other world’ encountered (Shushan, 2009, 2018, 2022). In other words, the cross-cultural and trans-temporal universality of this fundamental structure to near-death experiences suggests it may reveal an objective reality. As such, it could be conceptualised as the ‘Perennial philosophy of NDEs’. All this said, not discussed is the concept of ‘structuralism’ (also developed by Levi-Strauss; Lévi-Strauss, 1963) which posits that’s themes which are cross-cultural or near-universal may be owing to the fact that we, *homo sapiens*, all share the same psychological structures – which itself was embedded in the neurosciences by Laughlin & D’Aquili’s (1974) ‘biogenetic structuralism’, positioning such structures of the mind in physical structures of the brain. This idea may be formalised by the field of neurophenomenology, which conceives that the structural phenomenological features of an experience are invariant and may have their origin in the objective world (i.e. brain structure), and by extension, the qualitative content as manifested uniquely between persons is variable and may instead derive from a subjective source (i.e. psychology and society) (Varela & Shear, 1999; Petitmengin, 2006). Therefore, the ‘core experience’ of the NDE may be instead reduced to the brain as localised in objective reality, versus proposing an objective realism to the experience. Acknowledging Shushan (2009), however, he does state that such universality of features “points to a type of single experiential ‘reality’, which may or may not indicate a single transcendental Reality" (p199).

In attempting to account for and accommodate the accepted, and extensive, differences in the content between individuals and cultures – or the ‘symbolic’ expression in Levi-Strauss terminology – Shushan (2009, 2018, 2022) chooses to use the theorising of Hick (1976) and of Price (1953) to frame his conclusions. The psychical researcher and philosopher of religion, respectively, imagined a posthumous perseveration of some form of consciousness

where one inhabits a type of collective and co-creative or participatory lucid dream, referred to as a 'mind-dependent afterlife'. This way, the differences in peoples' experiences of the after-death state need not undermine their being metaphysically existent (for an afterlife to be legitimate, it need not be singular). This is an especially interesting and provocative model, which when combined with the above proposition of the 'core experience' as also being based in reality, tries to confer an ontological veracity to both levels of the experience, i.e. universal features, and differences between persons/groups – in stark contrast to concluding a neural, and social-psychological foundation for each level, respectively. Shushan himself makes reference to the Bardo Thodol ("Liberation in the Intermediate State Through Hearing", or the Tibetan Book of the Dead) of Tibetan Buddhism (Sogyal, 1992), which also implies that the past experience of the dying person will be brought to bear in their experience at death, explicitly teaching that all experiences through the dying process are thought forms or the fluctuations of mind, and thus illusory. This is except for certain stages which present to the dying the true, and 'sky-like' nature of mind, that is, the 'Clear Light' (akin to a luminous void) as may be witnessed during the *Dharmakaya*. While this does mirror Shushan's objectivity assigned to the universal experience as well as the mind-generated nature of personal experiences – it differs in that the Buddhist conceptualisation regards the mind-manifested elements as still fundamentally illusory, and the Clear Light is essentially *without* content, reflective of the mystical experience and characterised by an egoless unity (if one recognises it as oneself, leading to liberation), as opposed to the features inherent to the 'core NDE'. This is echoed by Kripal, in Krohn & Kripal (2018), who when discussing the ontological implications of the near-death experience and updating the meaning of Plato's cave for a contemporary reader, analogised the manifested forms, i.e. the phenomena as appearing to the experiencer, as a movie witnessed on a screen, which is secondary and ultimately illusory – whereas the light shining from the overhead projector is compared to the divine light of the source of creation, and is primary and ultimately real. This being said, Shushan (2018) does quote Pure Land Buddhism's belief that special content of after death experiences like the deceased/other spirits would be real, including retaining free will.

In addition, a possible critique of Shushan's promulgation of such a dream-like afterlife as mind-dependent is that while there is evidence of NDEs (and thus potentially the afterlife

realm) having properties akin to lucid dreams, namely metacognitive function and capacity to control elements, this is still by definition a feature of lucid dreams, as well as occasionally of psychedelic experiences, shown by DMT participants of Chapters 3-5 of this thesis – and so the NDE can be considered subsumed by a lucid-dream or psychedelic model. As such, this may undermine NDEs' lucid-dream behaviour as being suggestive of its mind-dependence and thus implying some ontological veridicality, unless Shushan concedes this status being conferred to dreams and psychedelic experiences also.

Parapsychology

The very comparison of DMT and near-death experiences for the purpose of considering the molecule as providing a model of the NDE can imply a reductionistic paradigm; that the NDE is merely hallucinatory in nature. The extensive exploration of the neural underpinnings of specific elements of the NDE and DMT state in the discussion sections of the prior chapters, and not least the above segment on 'phenomeneurology', is also suggestive of this materialistic framework. However, one particular body of evidence seems especially able to present a challenge to this framework – that of parapsychology. As regards the main focus of the present thesis, there is a host of indicative data within the field of near-death studies itself. These include evidence for veridical out-of-body experiences (OBE), which, if assuming a dualistic model of mind and body, may be convincing in terms of the possibility of survival after death given the striking bodily separation which is subjectively reported. The most rigorous reports stem from prospective studies in hospital settings, minimising limitations of information leakage or memory confabulation (Greyson et al., 2006; Holden & Joesten, 1990; Parnia et al., 2001, 2014; Sartori, 2006). While this more stringent design lead to comparatively weak results, some individual cases were stronger (Mays, 2015; Sartori et al., 2006). Some significant cases in hospital settings, though retrospective, have been reported by Greyson (2021), and an impressive compendium of OBEs reported near-death has resulted in 92% being reviewed as corroborated (Holden, 2009). In the shared data of near-death narratives by Cassol & Martial et al, utilised in Chapter 5 of the present thesis, the partial re-analysis itself revealed that while 12/34 narratives involved an autoscopic OBE, 9/12 involved potentially verifiable information as to what was perceived.

Other anomalous phenomena in the near-death context, which are particularly intriguing and presently lack fully satisfactory explanations, but which do not dominate the literature as much as the former – and where more research is certainly indicated – are also numerous. For instance, so-called Peak in Darien experiences are those in which the deceased who are so frequently encountered in NDEs are not known at all by the experiencer (and later learnt of), or not known to have died (and is later confirmed) (Greyson, 2010), and as such are again very compelling as to the survival hypothesis. Shushan (2018, 2022) also reports these to have occurred in the near-death or shamanic experiences of small-scale indigenous societies. Similarly in terms of their paradigm challenging nature, near-death experiences, which are reported to be visual in nature, have also been identified in blind individuals, where 64% of the 14 *congenitally* blind reported this (Ring & Cooper, 2008). Shared Death Experiences (SDEs) or Empathic Death Experiences (EDEs), constitute, respectively, phenomena whereby multiple persons are near-death yet at least one returns from an NDE to report experiencing what the others experienced (who permanently died), or where at least one person not near-death appears to experience what a loved one is experiencing as they are dying (SCRI, 2021; Moody, 2011). NDEs which have an overt prophetic quality in content, suggesting world events, usually apocalypse-esque, to occur in the near future – yet prior to an immanent global enlightenment – are not uncommon (Ring, 1984, 1988). Though, specific given dates have yet passed, and such New Age visions may represent the eschatological impulses of religiously encultured societies (Bache & Ring, 2020). And finally, perhaps gesturing less at *survival per se*, but certainly at some non-locality of consciousness, includes one dimension of the many ‘after effects’ of NDEs which entails the putative induction or opening of psychic capacities (Sutherland, 1989; Greyson, 1983; Groth-Marnat & Summers, 1998). The NDE itself may, acutely, also involve many apparent instances of clairvoyance, precognition or telepathic experiences – which again have thus far not been adequately investigated – such as may be found in the majority of popularly published NDEs (e.g. Alexander, 2012; Krohn & Kripal, 2018; Moorjani, 2012).

Psi-chedelia: Psychedelic parapsychology

Although the above outlined anomalous phenomena may be indicative of a framework of understanding which must extend beyond current, possibly restrictive models (toward, for instance, a post-materialist, or post-physicalist paradigm) – just as the present thesis suggests psychedelics to be able to model, to a degree, transpersonal phenomena like NDEs, psychedelics may also be capable of engendering such above anomalous phenomena, which may or may not be owing to psi-based processes. In this way, endogenous psychedelics, such as DMT, could well contribute to these effects, near-death or in other spontaneous scenarios, as often suggested (Luke, 2012; Roney-Dougal et al., 2014; Luke & Friedman, 2010). However, as elaborated at length in this thesis – especially the discussions of Chapter 5 and 6 – endogenous psychedelics need not be relied upon to account for these effects, as long as the brain activity, via whatever stimulus, simulates that which occurs with the action of a psychedelic compound. Our ever-more sophisticated comprehension of the nuances of the neural mechanisms of psychedelics entails a manoeuvre away from simple chemistry-based theories of psi, and toward incorporating the findings of psychedelic neuroscience – if indeed psychedelics, and their neural dynamics, may be important to processes of *psi* (that is, the underlying principle hypothesised to facilitate extra-sensory perception; ESP).

For example, Carpenter (2004, 2015) has developed a popular theory of psi – the ‘first sight’ theory (*c.f.* “second sight”) – which, in brief, posits that psi is an ever-present, constitutive, yet covert process intrinsic to the unconscious. The reason for its rare spontaneous manifestation (and difficulty in reproducing it with large effect sizes experimentally), is due to its systematic suppression by certain psychological structures. This is echoing of Freudian models suggesting repression of certain material of the unconscious (e.g. the *id*), or modern psychological systems accepting a delineation between the conscious and unconscious mind. Yet another framework for considering psi is that of Rousseau (2011, 2012), postulating a systems theory of NDEs – part of which suggesting that psi is employed during life to facilitate connection between consciousness and the body, and when near-death ‘psi power’ is released such that is then freed, ultimately enabling non-local phenomena to occur.

Pivotal, both these theories are highly compatible with and mirroring of attempts at developing unified theories of brain function under psychedelics. Namely, the ‘REBUS’

(Relaxed Beliefs under Psychedelics) or 'Anarchic brain' model (Carhart-Harris & Friston, 2019), which synthesises the entropic brain theory based on psychedelic neuroscience (Carhart-Harris et al., 2014; Carhart-Harris, 2018) and the free energy principle based on the brain as a predictive processor (Friston et al., 2006). In short, this model puts forward the *release* of top-down network control from higher-order, inhibitive networks, such as the Default Mode Network (DMN) onto lower-order networks, which leads to the *freeing* of intrinsic activity and a higher state of entropy (indexing richness of conscious content). This is a neural formalisation of hypotheses put forward by Carhart-Harris & Friston (2010), corresponding the DMN with the Freudian concept of the ego, and its role in inhibiting the global free energy (energy not employed in the homeostatic and survival functions of the organism) of the brain. Thus, the dismantling of the DMN under psychedelics leads not only to diminishment in higher-order psychological structures, such as death of the ego, but the manifestation of so-called 'primary cognition', which may mirror that of infants or ancestral man prior to the development of more sophisticated, but restrictive neural structures. In this way, this neuroscientific account of psychedelics furnishes the above psychological or systems approaches to psi, including the disinhibition of hidden, unconscious processes or releasing of physiological work otherwise engaged in bodily equilibrium, respectively, with a highly resonant neurally mechanistic dimension. Importantly, the embracing of more nuanced neural models for such anomalous phenomena need not reductively explain them, but simply provide a more updated or informed framework in which to understand them.

Other NDE features potentially challenging to prevailing ontologies

Elsewhere in this discussion chapter, it was suggested that the element of NDEs where experiencers are instructed by deceased relatives to 'return' to their bodies could represent a cultural propagation of early explanations that the revival of those near-death is due to dead ancestors informing the experiencer that it is 'not their time' to die. However, this would require some non-local account given most experiencers naivety to this meme – which could occur via morphic resonance, as detailed below. A neuropsychological mechanism is alluded to by Jansen (1997), where this feature reflects the dying mind's harnessing of the unconscious to provide a psychological motivation to survive, or even physiological feasibility of survival, presumably via some psychosomatic suggestion. Despite

this, there are numerous reports in NDEs of the experiencer being given the opportunity, by entities encounters, to *remain* in that ‘place’, that is, they are asked to make a decision either to stay or return – which would not be predicted by either of the above theories. Several examples of this can be found in Greyson (2021, *see Edith*), as well as in the NDE narratives upon which Chapter 5 of the present thesis was based.

The general difficulty in fully accounting for the entity encounter phenomenon has been explored mainly in the discussion of Chapter 3 and 4 (which may involve neural predictive processing of ambiguous visual imagery, including pareidolia; activity of theory of mind processes, such as TPJ activation or disruption of predictive processing in social inference; the synthesis of such visual and cognitive functions across neural desegregation; the dissociative identity disorder-resembling fragmentation of the sense of self, etcetera). But despite these models, the intense, complex, baroque, meaningful, and personally and universally significant experiences with entities is far from being adequately explained. Especially challenging to reduce is the aspect exhibited by such encounters of being bestowed with, or asked as to the completion of, a ‘mission’ in one’s life. George Ritchie’s NDE, an American army doctor who inspired Moody’s *Life After Life* (R. Moody, 1975), included what is now regarded a classic trope across many reports, in which beings of light during his ‘life review’ episode questioned him; “What can you show me? What have you done with your life?” (Ritchie & Sherrill, 1978). Similarly, 11% of DMT occasioned entity encounters involved being given a certain task or mission (Davis, Clifton, et al., 2020). It is not straightforward to provide a neuropsychological or other account for this nuanced, and repeated, experience.

In a commentary made (Michael, 2022) upon a recently published book on the NDE (Greyson, 2021), the present author suggested that despite the myriad neurobiological accounts, including those derived from the psychedelic sciences, of the phenomenology of the near-death experience – there may be a constellation of anomalous experiences which are yet to be accounted for. One of these included the life review feature, or specifically, the experience by which the dying appear to be perceiving and feeling from the perspective of other persons in their life; a phenomenon referred to by Lorimer (1990) as ‘hyperempathic resonance’. Michael (2022) quotes an interviewee of Greyson’s which emphasises the sheer level of detail by which the interviewee experiences the internal state, thoughts and feelings

of another individual in their life review. This said, there may still be neural models which could contribute to some explanation of this, namely, neural networks which mediate theory of mind – that is, the faculty of generating the sense of another sentient agent’s presence and an ability to model the contents of this other agent’s mind. As discussed at the end of Chapter 3, in the context of accounting for entity encounters, several circuits linked to the function of theory of mind (ToM), or ‘mentalisation’, may be recruited in the DMT and psychedelic state (and may be extrapolated to the NDE state given this shared feature). For instance, the temporo-parietal junction (TPJ) is part of the mentalising network (Aichhorn et al., 2009) and its activity has been associated with social inference (Frith & Frith, 2000). Increased global connectivity and integration has been evidenced in the TPJ and insula (Tagliazucchi et al., 2016), and the TPJ, especially the angular gyrus element, is a robust part of the proposed neural cascade near-death (Martial, Cassol, et al., 2020), on account of the reliable elicitation of OBEs with its interruption (Blanke et al., 2015). In this way, ToM processes are constitutively operative in a covert manner, and when its underlying circuitry is upregulated, for instance near-death, a convincing reanimation of the simulation of the experience of other persons with whom one is interacting could underly this ‘hyperempathic resonance’ effect. While this is so, the seemingly perfect reproduction of another’s experience in such resonance, especially in Greyson’s above provided case where the experiencer appears to also ‘know’ the other individual’s memories to which he could not have access to, does still challenge if these neural models are adequate.

Explaining the DMT-NDE similarity

A ‘DMT Syndrome’? – Why are experiences similar across DMT experiences?

Given the internal consistency of near-death experiences, the relatively reliable phenomenology of NDEs themselves may be considered a ‘syndrome’ (not in a pathological sense, but denoting its consisting of a repeat constellation of feature). Before discussing ways to account for the level and type of similarity concluded by the present thesis between the NDE and DMT (and analogue) experiences, the clear repeatability of content between different *DMT* reports themselves – as firmly illustrated across the content analyses of the first three experimental chapters herein – should first be discussed. This could, in turn, have implications for the comparability between the NDE and the DMT state. Such intersubjective

overlap could be accounted for by mere expectation – as implied in the limitations section in Chapter 3 – where the experienced subjects used constitute a subculture in which the mythology of the DMT experience is well-known. As such, various ‘memes’ as to the DMT trip might penetrate into their subsequent experiences. If, on the other hand, the DMT experiencers are instead naïve to DMT or this lore around it, and yet still report themes consistent with it – as has been reported on many occasions (Gallimore & Luke, 2015; Luke, 2008, 2013) – then other mechanisms must be at play.

One such possibility is the fact that the wider culture itself (outside the psychedelic community) is populated by certain imagery through all manner of media, where exposure to themes of a science-fiction or fantasy (or even horror) nature could also at least contribute to DMT experiencers’ reports sharing such content. While this is one hypothesis, it certainly would not account for why DMT of all psychoactive substances would be especially predisposed to tapping into such a component of the cultural milieu. However, further research, such as correlating specific DMT experiencers’ trip content with the film, TV and literature they consume could help illuminate this. To expand on this, a crude short-list of common tropes identified across the DMT analyses of the present thesis (Chapters 3-5) may include: geometrics, hypercubes, machinoids, laboratories, clowns, playpens, hieroglyphs, insectoids, snakes, cellular structure, eyes, etc. As such, the DMT world could be synopsised as being ‘temporally regressive’, predicated on the popular psyche or collective consciousness, and possibly based on innate fears (e.g. predatory/parasitic animals). Such themes and their qualities can be relatively neatly encapsulated by the aesthetic and imagery of ‘science fiction, fantasy or horror’, which characteristically plays upon such reminiscences of childhood, mythic and ancient themes. This, however, is entirely speculative, and recalls the potentially unanswerable question of the causative directionality between culture and experience. Does the DMT experience look the way it does because it inspired such sci-fi/fantasy memes, or these memes themselves filtrated into the DMT experience? While it is often intuitive to claim the latter (experiences being derived from enculturation) – the ‘experiential source hypothesis’ (Hufford, 1982) suggests the opposite i.e. that primary experiences are that which tend to inform social constructs (such as belief). This has been indicated to be most likely the case regarding NDEs, where ancestral NDEs influenced the development of belief in the afterlife (versus belief and

expectation of the nature of the afterlife determining NDE experiences; Shushan, 2009, 2018). Naturally, both processes co-occur in a complex mutually re-enforcing cycle. In this case, the emergence of DMT use in the west would likely have included imagery more intrinsically related to the substance (albeit what this is may be at this point impossible to disentangle), which would thus inform the lore amongst the DMT subculture – alongside the alternate process where the popular imagery of society, particularly the DMT-using subcultures, would have inevitably incorporated into the experience owing to the principle of ‘set’ and the suggestibility enhancing effects of psychedelics.

Much content, though, may be so specific and yet common between experiencers, that being acquainted in such a general sense to sci-fi/fantasy media seems an insufficient explanation. Another possible mechanism is a neural, as opposed to a social one, where DMT may regress brain activity to that which is common to all human beings. Though this is speculative, the psychedelic neurosciences, including with DMT (Timmermann, 2019), demonstrate the dismantling of more recently developed cortical networks and the release of neural entropy (Carhart-Harris & Friston, 2019), giving rise to a state of so-called ‘primary consciousness’ (Carhart-Harris & Friston, 2010), which parallels that of the child’s brain or, hypothetically, the brain of ancestral humans. In this way, activity of such infantile and/or evolutionary regression could be associated with conscious content paralleling the childlike or archaic nature of much of DMT characteristic phenomenology.

Yet another mechanism, in the case of naïve DMT experiencers, or if the general cultural milieu is not sufficient – yet significantly more speculative than either a social or neural explanation – is that of morphic fields, or morphic resonance (Sheldrake, 1988). In brief, morphic resonance attempts to help explain the laws and structures within nature by proposing the accumulation and reinforcement of fields associated with them over time, in a comparable way to how habits form. This process is non-local, in this way, and so information is accessible from one system to another if the two are resonant with each other. For instance, Sheldrake (2011, Chapter 7) suggests that the known formation of novel crystalline structures being associated with the subsequent greater ease or speed of this new structure of crystal to form, instead of being due to the seeding of the crystal’s microparticles via the atmosphere (or, indeed, chemists’ beards), may better be explained by morphic resonance. Comparably, Sheldrake (2011, Chapter 7) argues that the folding into

the complex quaternary structure of proteins, entailing the correct selection from a myriad of permutations, isn't sufficiently accounted for by classical models, where instead the habitual prior folding of such proteins offers a morphic field by which they instinctively fold. However, recent advances in quantum biology has indicated probable quantum delocalization and superposition achieving such molecular calculations and facilitating protein folding (e.g. Luo & Lv, 2020). The learning by rodents of a particular maze environment being associated with the subsequent shorter time required to learn such a maze, not only by descending generations of the initially trained rats, but sometimes a different and remote group (and thus not explicable in terms of Lamarckian, or epigenetic, inheritance) is also levied by Sheldrake (2011, Chapter 9) to suggest morphic resonance's action. One study demonstrated an increase of conditioned aversion to a stimulus in chicks upon first exposure, after previous chick groups had been similarly conditioned, again gesturing to a morphic resonance effect (Sheldrake, 1992). In similar vein, it has been proposed that such morphic resonance, and information access, can occur across human brains, for instance in the case of language acquisition (Sheldrake, 2011, Chapter 10). While there has been some support for this, where authentic versus imitative Chinese characters were more likely to be recalled (Robbins & Roe, 2010), Roe & Hitchman (2011) failed to replicate this using more rigorous methodological design.

Despite robust evidence being as yet lacking for the theory, Sheldrake (2017) has put forward the intriguing suggestion that similar content in psychedelic experiences may be owing to the resonating of the individual ingesting the substance with those individuals who have previously ingested the substance. As such, a 'morphic field' for experiences generated by this particular substance has been created, and the content of which may be accessed if the brain is resonant with this field – presumably by conforming to the same neural configuration as prior users. Sheldrake has put forward a hypothetical experiment in which a novel psychoactive substance is synthesised, and naïve individuals are, while under its influence, exposed to specific imagery incorporated into the environment. According to morphic resonance, when subsequent individuals experience this substance, beyond this particular setting, similar imagery congruent with the original environment should arise.

If this were transpiring as regards the DMT experience, this could potentially also help account for the extremely reliable and profound sensation of *déjà vu* – wherein the

subjective sense of familiarity with the specific content generated may be born of the individual themselves, not having previously experienced the drug, but of resonating with the state of previous individuals already having experienced it (this said, the reason for why such specific content would have been generated by the first experiencers of DMT, i.e. the early instantiation of the DMT morphic field, is unknown). The concept of psychedelic imagery being derived from previous users' experiences has its precedent with Albert Hoffman, the synthesiser of LSD, himself, where after Hoffman's synthesis of psilocybin and its distribution to medical institutions across the USA, reports returned as to experiences of patients and psychiatrists, naïve to the compound's providence, involving Mayan-Aztec content (Luke, *personal communication*, 5th April 2022). The partial equivalence between the idea of morphic fields and that of the archetypes, or the collective unconscious – where the chronological aggregation of the behaviour of nature and organismal experience becomes, itself, 'archetypal' and exhibits some permanence, which may be rooted in biology (such as the nervous system), is strikingly suggested by one quotation by C. G. Jung:

“the term archetype is not meant to denote an inherited idea, but rather an inherited mode of functioning, corresponding to the inborn way in which the chick emerges from the egg, the bird builds its nest, a certain kind of wasp stings the motor ganglion of the caterpillar, and eels find their way to the Bermudas. In other words, it is a “pattern of behaviour”. This aspect of the archetype, the purely biological one, is the proper concern of scientific psychology”

There are a host of specific examples of such experiential resonance between DMT participants of the present thesis, as well as with experiences outside the study, which may be demonstrative of such an intersubjective validation of the experience, and in turn possibly endowing it with a certain ontological validity afforded by an entertaining of the morphic field theory. Just some examples of this include at least 2, independent cases of flirtatious, dancing feminine entities inciting the realisation of the universe constituting a fundamentally playful domain without parameters (See Chapter 3), or at least 5 cases of frenetically transforming cubes of a hyperdimensional structure (see Chapter 3). One example to elaborate on is the trope of an often hostile, serpentine being with multitudinous eyes associated with death, which may be all-powerful or hyper-intelligent – or permutations thereof. *RH's* first DMT trip involved an experience of dying and 'limbo'

which entailed a terrifying being with innumerable eyes (Chapter 5). This closely echoed yet another experience of his, in the second trip, including a dying feeling and a limbo space, which preceded encountering a being which extended numerous tendrils and was so intelligent as to constitute a ‘conglomerate’, yet in this case radiated love and (Chapter 5). Luke (2008) has chartered this reliably emerging trope across a host of DMT reports, where experiences of disembodied eyes are often associated with snake-like entities – which in turn may be linked to deities or demons formally connected to death or the afterlife, such as the Tibetan demon, *Za*, closely corresponding to other Persian, Assyrian or Islamic divinities, such as those fulfilling psychopompic functions. Meyer (1992) quotes an online trip report:

“...a large creature, with many arms, somewhat like an octopus, and all over the arms were eyes, mostly closed, as if the creature were asleep or slumbering. As I approached it the eyes opened, and it/they became aware of me. It did not seem especially well-disposed towards me”

Pup (2006) recounts another DMT report:

“It had [innumerable] tentacles, like a cross between some weird octopus or jellyfish...and the EYES! OH MY GOD THE EYES!!!... at the mercy of [something] much, much, bigger and complex, and clever and definitely [more] malevolent than myself”

Luke (2008) himself suggests that

“these similar visions [may] all belong to a particular morphogenetic field (a field of consciousness that contains imprints of past experiences which can be accessed by others) activated by chemically-induced near-death-type experiences”

Correspondences in specific and nuanced experiences are also evident between the DMT reports of the present thesis and many other published reports, especially those reported by Strassman (2001), as illuminated by an analysis (not included herein) by the present author of the raw interview data shared by Strassman. For instance, *JM* here described amorphous, laughing, distracting beings in spinning, mechanical, dimensionally warped environs highly reminiscent of the trickster-like McKennian ‘self-transforming machine elves’ (see Chapter 3). One subject of Strassman (2001) also described:

“rounded tubes... Machine-type things. Like those fiber optic lamps... There was one big machine in the center, with round conduits, almost writhing; not like a snake, more in a technical manner”

Where Gallimore (2013) also describes online reports evidencing both this specific environment and the particular beings:

“Layer after layer of giggling...beings... the hilarious...energy creatures vied for my attention”

“A wacky toy factory. Gadgets, widgets, twirling machines, stair-step pattern, Escher-like “space”...The beings would seem to go “look!” and I felt I was supposed to look”

TM, in his first DMT trip, reported doctor-like octopoid creatures in a laboratory who, while reassuring him as he lay paralysed, presented him with a screen as they prepared tools.

Comparably, Strassman (2001) documents two participant’s experience:

“four distinct beings looking down, like I was on an operating table...they had done something and were observing the results”

“I was in an alien laboratory, in a hospital bed...their sense of purpose was [alien]...they had a space ready for me”

Strassman et al. (2008) also reported a resonant experience from Strassman’s studies:

“There was a female who...appeared and reassured me. Something green appeared in front of me, rotating, doing things. She was showing me, it seemed, how to use this thing, which resembled a computer terminal”

Perhaps most impressively, MP articulated holographic, digital surroundings amongst hieroglyphic language, followed by locating himself in a playpen which was supervised by a moth-like entity performing a body scan, culminating in emerging in an infinite black space. All of these appeared to be present in Strassman’s (2001) descriptions, including in one particular participant, and seemingly in the correct order also:

“It was Mayan hieroglyphics... The hieroglyphics turned into a room, like I was a child, there were toys... an alien type, insectoid, not-quite-pleasant side of this... It's like a hologram, it's a whole body effect...”

“There was an insect-like thing...started hovering over me... Then I was yanked/catapulted...sucked me out of my head into outer-space...a black sky with a million stars” (the same subject, after a subsequent dose)

A second participant also reflects the scanning component:

“High tech nursery...after having been processed; the holding area... Like being a baby, you have something done to you... I was definitely being put through some kind of equipment/instruments”

While the four main examples given here involved participants who, independently, claimed that they themselves were unaware of the specific experiences reported by Strassman (including RH’s lack of cognizance of the many eyed serpentine being and its associated wider mythology) – the process of cryptomnesia (‘hidden memory’) may still be at play, whereby individuals feel an experience to be novel or an idea to be original only on account of having forgotten prior exposure to it.

The final potential explanation to be discussed here as per such partially consensual experience across DMT, where such postulations have thus far been incrementally more speculative in nature, includes the possibility that the DMT world connected to is indeed an independent, ontologically valid reality. This would incorporate the, somewhat simplistic, idea that DMT, the molecule, may act as a “reality thermostat” facilitating the switching of the ‘channel’ to which the brain is by default attuned, to one allowing access to another mode of experience, indeed another free-standing reality (Strassman, 2001). Gallimore (2019), in a considerably more nuanced framework accounting for the cortical computational transitions DMT engenders, posits that DMT permits access to an “orthogonal dimension”. One rationale for this hypothesis is that DMT, with closed eyes, has been evidenced to elicit brain activity which mirrors that observable with visual stimulation (Alamia et al., 2020). That is, the underweighting of priors alongside the overweighting of prediction errors, i.e. an elevation of ascending activity and a predominance of forward, versus backward, travelling waves. The fact that this occurs without any input of external sensory data may, in this way, suggest to Gallimore that such data may be deriving from an exterior source to this particular dimension.

However, what is not seemingly considered is that DMT has also been identified to induce high powered theta oscillations across the temporal cortex (Timmermann, 2019), which is a key neural signature of memory recall and especially REM dreaming. As such, the DMT experience may still be considered dream-like, and derivative from intrinsic (i.e. the medial temporal lobe, including the hippocampus, e.g. Carhart-Harris, 2007), versus extrinsic (such as otherworldly) sources. This being said, while the construction of a world model without sensory input during the dream-state is analogous to the generative model of another world in the DMT state – the fact that the latter world is dramatically more novel than the former undermines the dream framework of the DMT experience. That is, the dream world is still highly correspondent with the waking world, given the brain’s construction of a model for the regular, consensus environment over developmental (and evolutionary) time, whereas the world of the DMT space is fundamentally other than, bearing virtually no resemblance to, that of the waking world – and as such, it seems unlikely to derive from intrinsic (brain-derived) sources (Gallimore, 2019). Additionally, it must be acknowledged that the DMT state only in certain manners resembles REM dreaming – and these similarities and differences echo the differences delineated all throughout the present thesis in respect to DMT’s comparison with NDEs. Regarding DMT and dreams, similarity may include the obvious entry into another world, meeting of other social agents, its fluid, transitioning nature, and the (non-lucid) conviction of its apparent reality. The exact content, however, is vastly different, in the DMT space’s idiosyncratically psychedelic nature (as concluded in Chapter 5). One example being dream characters predominantly being human beings, often known and living, versus the plethora of otherworldly entity-types in DMT (as focused on in Chapter 3). Similarly, dreams are also substantially informed by personal memories, while content overtly corresponding to a person’s autobiographic memory is highly limited in DMT. However, regarding the fluidity sometimes inherent to DMT, it is also marked by a degree of stability, and (as discussed above) may be more akin to mechanisms related to usually stabler lucid dreams, which are also importantly more given to anomalous phenomena. Taken together, then, it could be considered that DMT’s temporal theta activity may not be a neural marker of *typical* REM dream processes, but may instead permit – in some manner thus far not characterised – access to memories of a more transpersonal nature. That is, of an ancestral nature akin to Jung’s archetypal or collective unconscious, which may be embedded in deeper neural structures and motifs, such as those

‘neurognostic structures’ proposed by Laughlin (2000) – or perhaps of a nature represented by morphic fields, as discussed above.

An ‘NDE-mimetic’ – Why is DMT similar to (but not the same as) NDE?

Taken together, finally, how can we account for the type of similarity/difference concluded by the studies of the present thesis between NDEs and DMT? That is, the experience only occasionally and partially reproducing an NDE with high fidelity, but fundamentally with content still typical of DMT. Such postulations are not dissimilar to those above addressing the similarities between DMT reports; those of a psychological, neurological nature, and those which are more speculative including metaphysical frameworks and those related to morphic resonance. These former postulates have been elaborated mainly in the discussion of Chapter 5, including expectation effects unique to NDE circumstances, or neurological accounts. The latter may be particularly explanatory, where in the DMT state, the brain is suffused with an inordinate quantity of DMT (far higher than that endogenous to the body) – whereas in the NDE state, the DMT increase, as found in rodents for instance (Dean et al., 2019), is likely only a minor element amongst a symphony of disparate neural events occurring (e.g. Martial et al., 2020). The DMT increase in the rodent brain at death is also only on average 6 times baseline levels, which is significantly less than concentrations with exogenous use. Similarly, that other activity, especially other neurotransmitters may be in fact exerting their influence over and above DMT, particularly serotonin (Li et al., 2015), may also explain the DMT state only very superficially mirroring NDE content.

As regards frameworks pertaining to the collective unconscious, as mentioned above – given that death is that which is inextricably entangled with life, and in this sense may be a universal symbol of existence, the emergence in the DMT state of experiences which may be a fundamental part of the collective psyche – that is, the archetypes – especially those related to death and dying, may be inevitable. Their emergence may be particularly expected in light of the sheer prodigiousness of the content available in the DMT state. In weaving this into the morphic resonance framework, as above – morphic fields are those which become more integral or coherent over time, as the particular habit of nature is further ingrained – very much like a Hebbian synapse, where “neurons which fire together, wire together” i.e. continued use strengthens the connections within the network (which is,

neurobiologically, how behavioural habits are formed, hence morphic fields underlying the 'habits of nature'). In this sense, if conceptualising the experience of dying as a morphic field, it may very well be that the act of *dying* is the most universal, ubiquitous and inevitable of acts of a living organism, and as such the field associated with it may be the most well established. Thus, there may be something akin to an especially strong gravitational well toward this field by various inductive mechanisms, where DMT may be one, and thus some experiential content bound with dying may be predicted. However, if DMT is not a key component of the dying brain physiology, then the resonance will be minor, thus accounting for the only marginal qualitative comparability. The concept that there may be a morphic field for the dying process – though not expounded in the literature – was stated by Sheldrake to be a possibility (Sheldrake, *personal communication*, 6th April 2019). Hick's (1976) variation on Price's (1953) aforementioned mind-dependent afterlife model is also consistent with this here propositioned constructive and destructive interference-resembling morphic field theory of death, wherein souls are “pooled to produce a common environment...by the cancelling out and mutual reinforcement of the multitude of individual...memories and desires of all the human beings who have died since man began”, with the other world being in a perpetual state of re-construction as “new sets of memories are contributed to the common stock... [and] the prevailing pattern of human desires [and memories] changes” (Hick, 1976, p. 270-1).

If entertaining a cosmology in which morphic resonance is operative, then – while there may be the more neurologically reductive account for the DMT state mirroring other DMT states due to the same chemical simply exerting its effects – a morphic field account would involve the DMT space “looking like” the DMT space owing to the user accessing the brain-states of all those previous users of DMT – potentially more robustly explaining the reproducibility of certain content, especially in the naïve (and in this sense drawing upon the same reservoir of conscious experience). This can also, then, apply just as aptly to the NDE state itself, where NDEs may “look like” NDEs – again, including the particularly well-established syndrome of features and repeatability of content – because those who die are accessing the brain-states of all those who have died in the past. In the same way as surveying a wealth of DMT qualitative data for internal consistencies, such as between the DMT field study and Strassman's original interview transcripts, to speculate on the relevance of

morphic resonance as mentioned above – the comparison of the consistency or otherwise between DMT field study data and the near-death experience, as has been the focus of Chapter 5 herein, may also be seen as an exercise to theorise as to the importance of morphic resonance. That the DMT and NDE space, ultimately, are substantially different in content could also be conceived to be due to the very different, and so separate, morphic fields which have been generated around the two of them. One can combine Sheldrake’s theory – of as yet immeasurable fields embedded in the universe, which may encompass resonance between organic systems – with the more palpable theories of how consciousness is associated with the organ of the brain, such as integrated information theory (IIT; Tononi et al., 1998). IIT implies that each moment of conscious experience is totally unique, and can be conceived as having a novel structure – a hyperspatial crystalline structure:

“The quality of any one experience...is conveyed by the informational geometry associated with Phi [the unit quantifying consciousness according to IIT]. The theory assigns to any one brain state a shape, a crystal, in a fantastically high-dimensional qualia space. This crystal is the system viewed from within. It is the voice in the head, the light inside the skull... The dream of the lotus eater, the mindfulness of the meditating monk...all feel the way they do because of the shape of the distinct crystals in a space of a trillion dimensions—truly a beatific vision. The water of integrated information is turned into the wine of experience” (Koch, 2013)

As such, the DMT and NDE states, as moments of consciousness, could be considered to have associated with them a special hyperspatial crystalline structure, which would only minorly overlap, and thus though possibly strongly overlap in terms of phenomenology may only marginally interleave in terms of content. The aforementioned analyses by this author of Strassman’s reports also revealed some parallels with the near-death experience – thus constituting a further rich corpus of data to mine the DMT-NDE comparability, and the potential of this to bear on the operation of morphic resonance between the two states.

Finally, the proposition that the DMT experience represents a genuine penetration into an ontologically valid space, or ‘orthogonal dimension’ (Gallimore, 2019) – that is, a ‘breakthrough’ into a world which appears sufficiently consistent and stable – may be equally applied to the near-death experience. For instance, participant *LG*, as discussed in

Chapter 5 (whose experience was reproduced in Appendix C), insinuated that taking DMT does not lead to states which are comparable with the NDE, but in a metaphysical sense facilitates entry into the 'spirit world' – in his case, on account of the entities, or 'spirits', showing confusion as to why an individual who is not authentically dying has emerged in their domain. In this way, the interpretation is that when one exogenously administers DMT they may be, in essence, 'hacking' the neurophysiological program, of which DMT is a part – which is in some not yet explicable way associated with non-local consciousness – unfolding at the onset of death (triggered by anoxic neural stress). Crucially, however, DMT is only a singular part of this psychochemical program elicited near-death (Dean et al., 2019), as discussed above, yet in some cases may lead to a breaking through to a parallel space to which one breaks through in a near-death experience (or indeed after death). That this program can be considered as such, i.e. a 'program' implying an established mechanism to be activated upon specific triggers, is bolstered by Li et al. (2015), including the above discussion of the cortico-cardiac signaling during rodent death suggesting a physiological attempt to revive the organism until a shift toward an acceleration of the death process – potentially pertaining to the appearance of the 'border of no return' in NDEs – as well as hypotheses as to the NDE being a part the evolutionarily conserved behaviour of thanatosis.

Peinkhofer et al. (2019) have surveyed the phenomenological syndrome and putative mechanisms of the NDE, which importantly for the discussion of possible brain-independent access to extrinsic realities, incorporates some embracing quantum theories. Gaiseanu (2017) proposes the disembodiment of consciousness (OBE) to be due to the extraction by the quantum information field of the quantum information intrinsic to the brain, and the tunnel effect to be a visual manifestation of the transition between these two quantum substrates. Hameroff & Chopra (2012) have referred to a "quantum soul" in discussing the implication for NDEs of Hameroff & Penrose's (1996) model of consciousness depending on the quantum coherence and entangled states between microtubular tubulin and fluctuations in spacetime geometry. In this view, neuronal anoxia precludes (high energy and decohering) action potentials, but the proposed consciousness-mediating cytoskeleton in neurites would be spared and their quantum coherence amplified, thus accounting for transient expansions in consciousness. Consciousness may thus persevere as entangled fluctuations in such spacetime geometry, transiently until returning to the revived brain, or

theoretically fully independently of the brain's support. Hameroff (2017), relevant to the non-local activity of consciousness during the DMT experience, or indeed the implication of DMT near-death, has suggested that some psychedelic compounds may be able to permeate the neuronal membrane and interact with the microtubular substructure, thus affecting consciousness alternatively to receptor agonism and neuronal depolarisation, and suggests for support of the microtubular-consciousness model given the action of consciousness-expanding psychedelics on layer 5 pyramidal cells which harbour some of the greatest densities of microtubular filaments.

Taken together, then, the hypothesis of the DMT and NDE space representing free-standing realities – though which may more incompletely than completely overlap, as concluded by the studies of the present thesis – implies that the DMT space, though in a minor capacity, *mirrors* that after death. In other words, they may be 'the same' simply because they offer access to the same place – which given they're also being evidentially different as per subjective content, perhaps may be analogous to visiting different cities of the same 'undiscovered country'.

Chapter X: Conclusions and final implications

In all, this thesis investigated, in a mixed methods though predominantly qualitative manner, the experiences from different substances and their comparability with the near-death experience, and how this has implications for their experimental modelling of, psychophysiological contribution to, and ontological implications regarding the NDE. While some evidence was found to suggest a minor role of *N,N*-DMT, and greater potential roles of 5MeO-DMT in some domains and for the monoaminergic system in tandem, convergent downstream neural effects with differential triggers may still ultimately predicate the NDE.

Related to this, the ontological implications were especially explored in the present discussion chapter, where an effort to subsume all NDE features into a paradigm under the cognitive neurosciences, especially the neuroscience of psychedelics or the dying process, was mostly successful – except for a certain constellation of features. Similarly, a brief review of parapsychological phenomena during or linked to NDEs, either featured in those NDEs included in the present thesis or known to be in the literature, was presented, which themselves also provide a challenge for the prevailing neurocentric model of consciousness. Due to such potential inadequacies of a purely neuro-reductionist approach, some accept the survival hypothesis and have developed an afterlife model to account for all observed phenomena, such as universal mythemes and subjective symbols (though these may be neuropsychologically explainable) – and the present thesis offers other models, including that of morphic resonance, for instance to account for the repeated intersubjective pattern of experiences on the level of subjective content. Morphic resonance is theoretically consistent with the collective unconscious being characterised as a reservoir of experience established with continual ingraining by the collective psyche, yet with the addition that the experience is more accessible with a person's greater resonance with previous experiencers (that is, arguably a form of non-local state-dependent memory). Neurognostic structures are an important idea which may integrate content of the collective unconscious with neural activity (Laughlin & D'Aquili, 1974), but this transmission of information may be non-evolutionarily inherited and instead be transpersonal in nature, mediated by something akin to morphic resonance where one nervous system's resonance with another one displaced in the past may facilitate access to the former's experience.

Other encompassing models of consciousness to help explain – critically, without explaining ‘away’ – dimensions of experience as illustrated in this thesis by psychedelics or NDEs, must be seriously researched to progress from super-naturalism and instead develop an, importantly, *extended* naturalistic framework under which they may be subsumed. While any elaboration of these are beyond the scope of this chapter, they may entail quantum models like hyperspatial theories (Carr, 2022) or those involving entanglement (Radin, 2009). However, the vast challenge is presented to future researchers of this field to succeed in an integration of the knowledge available at the vanguard of the sciences with the plethora of phenomena not yet presently explicable, not unlike the neurognostic-morphic resonant concept above, and a further quantum example aiming for this, incorporating neuronal cytoskeletal architecture, includes the Orch-OR theory (Hameroff & Chopra, 2012). This integrative challenge is while not succumbing to the hitherto overpowering temptation to treat the former as obsolete in favour of models, though themselves valuable attempts to integrate neuroscience, which may be either difficult to reconcile with the evidence amassed of the neural correlates of consciousness, or may be erroneous in some details such as psychedelics exclusively showing reductions in brain activity despite expanded consciousness. Examples include the idealist inversion that the brain is a manifestation of Mind at large (Kastrup, 2022), or the more dualist, transmissional interpretation of the brain as “an organ of adaptation...selecting...channelling and constraining...a consciousness inherently far greater in capacities”, such as the Resonant Opening to Subliminal and Transpersonal Assets (ROSTA) models (E. F. Kelly, 2015). The most promising models will be those which take state-of-the-art, unified hypotheses of brain function, and integrate them in the context not only of experiences elicitable by psychedelics – as has been achieved with IIT (Gallimore, 2015) or the free energy principle (Carhart-Harris & Friston, 2019) – but in the context of the transpersonal, and indeed, potentially trans-material nature of consciousness as a whole, as implied not only by NDEs as explored in this thesis, but also other phenomena such as ET encounters, mediumship or reincarnation. The continued, neuroscience-informed research into such phenomena may have ground-breaking consequences for our comprehension of and relationship to reality itself.

This thesis has essentially exclusively focused on the question of propositional truths, that is, what are the neurochemical substrates of the near-death experience? – and this has been at the expense of the illumination of non-propositional truths, that is, for instance, what is the meaning of the experiences by those who have them and what are the consequences of them for their lives? Irrespective of the answers to the former, it is indisputable that there is profound meaning inherent to psychedelic and near-death experiences and they have an unprecedented potential energy to enact positive shifts in one's attitudes and behaviours in response to their interpersonal and ecological relationships, and that with their own mortality. Indeed, the very exercise driving this thesis of looking at psychedelic experiences and how they dovetail with NDEs is reflective of the entheogenic deployment of these substances, which are inductive of rebirth experiences, for the very immanent, pragmatic purposes of maintaining social, environmental and cosmological/metaphysical cohesion by shamanic societies (Winkelman, 2019), or in more recent antiquity by mystery cults (Muraresku, 2020). This includes suggestions that NDEs during *homo sapiens* civilisation had similar effects (Lake, 2019) and were thus subsequently reproduced by different modes, such as the harnessing of psychedelic flora (Shushan, 2009, 2018). Near-death experiences shift those who have them not only toward decreased fear of death or increased belief in an afterlife (Groth-Marnat & Summers, 1998; Sutherland, 1990), but spiritual *growth* (Greyson & Khanna, 2014) and concern for *others* (Groth-Marnat & Summers, 1998; Pim Van Lommel, 2002). Analogously, psychedelics are linked to shifts toward animism, perseveration of post-mortem consciousness or telepathy (Nayak et al., 2022; Sandeep & Griffiths, 2022), or dualism or idealism, which covaries with enhanced *wellbeing* of the individual (Timmermann et al., 2021), and is also associated with increased *altruism* (Griffiths, 2022).

In other words, the experiences and their influence on one's cosmology – most crucially, whether or not such metaphysical beliefs are 'correct', and may otherwise render the experiencers 'delusional' – may in fact lead to the selfless benefitting of others. In this way, not only is the continued research of these experiences of great importance, but the ever-progressing decriminalising/legalising and medicalising of psychedelics, alongside the ever-improved sophistication of resuscitative technologies will prelude more people undergoing such induced and spontaneous profound, mystical transformative experiences. The eventual consequences of this may be difficult to over-estimate, and parallels the postulation by Ring

(1984; 1992) – one of the first pioneers of NDE research and whose personal experiences with psychedelics pivotally informed his research (Blackmore, 2020) (and mirroring Mack, 2000, as regards alien abduction) – that the NDE resembles a shamanic rebirth with the potential to induce immense shifts in collective consciousness and indeed midwife a societal renewal. Religio-cultural revitalisation movements of indigenous groups have also frequently been inspired by their members' NDEs or shamanic visions (Shushan, 2018). In a final layering to this picture, this in turn echoes both the prophetic visions of many NDErs (Ring, 1988) and repeated high-dose LSD visionary experiences (Bache, 2019) similarly suggesting immanent global dark nights of the soul, which may be transmuted to an entry into a 'golden age' if the species' development reaches criticality. This is a process of which NDE and psychedelic experiencers, democratised mystics as they would be (yet alongside the necessary supportive infrastructure, Timmermann et al., 2020; Michael, 2022a), may well be a vital part.

References

- Acosta-Urquidi, J. (2015). Qeeg studies of the acute effects of the visionary tryptamine DMT. *Cosmos and History*, 11(2), 115–129.
- Agin-Liebes, G. I., Malone, T., Yalch, M. M., Mennenga, S. E., Ponté, K. L., Guss, J., Bossis, A. P., Grigsby, J., Fischer, S., & Ross, S. (2020). Long-term follow-up of psilocybin-assisted psychotherapy for psychiatric and existential distress in patients with life-threatening cancer. *Journal of Psychopharmacology*, 34(2), 155–166.
<https://doi.org/10.1177/0269881119897615>
- Aichhorn, M., Perner, J., Weiss, B., Kronbichler, M., Staffen, W., & Ladurner, G. (2009). Temporo-parietal junction activity in theory-of-mind tasks: Falseness, beliefs, or attention. *Journal of Cognitive Neuroscience*, 21(6), 1179–1192.
<https://doi.org/10.1162/jocn.2009.21082>
- Alamia, A., Timmermann, C., VanRullen, R., & Carhart-Harris, R. L. (2020). DMT alters cortical travelling waves. *BioRxiv*, 1–18. <https://doi.org/10.1101/2020.05.06.080937>
- Alban, L., & Groman, W. (1975). Dreamwork in a Gestalt Therapy Context. *Bulletin of The American Psychoanalytic Association*, 35(2), 147–156.
<https://doi.org/10.1177/000306516601400209>
- Alexander, E. (2012). *Proof of Heaven*. Simon & Schuster.
- Allit, M. (2022). The Spirit of Salvia. *Anthropos Festival, Hertfordshire, September 10, 2022*.
- Alvesson, & Skoldberg. (2017). Post-positivism, social constructionism, critical realism: three reference points in the philosophy of science. *Reflexive Methodology New Vistas for Qualitative Research*, 15, 15–52.
- Apter, J. T. (1958). Analeptic Action of Lysergic Acid Diethylamide (LSD-25) Against Pentobarbital. *A.M.A. Archives of Neurology & Psychiatry*, 79(6), 711–715.
<https://doi.org/10.1001/ARCHNEURPSYC.1958.02340060109015>
- Aqil, M. (2022). Visual Hallucinations: At the edge of nature and culture. *Interdisciplinary Conference on Psychedelic Research, Sep 22nd-24th*.

- Archer, M., Decoteau, C., Gorski, P., & Al, E. (2016). *What Is Critical Realism?* American Sociology Association. <http://www.asatheory.org/current-newsletter-online/what-is-critical-realism>
- Atasoy, S., Roseman, L., Kaelen, M., Kringelbach, M. L., Deco, G., & Carhart-Harris, R. L. (2017). Connectome-harmonic decomposition of human brain activity reveals dynamical repertoire re-organization under LSD. *Scientific Reports* 2017 7:1, 7(1), 1–18. <https://doi.org/10.1038/s41598-017-17546-0>
- Athappilly, G. K., Greyson, B., & Stevenson, I. (2006). Do prevailing societal models influence reports of near-death experiences? A comparison of accounts reported before and after 1975. *Journal of Nervous and Mental Disease*, 194(3), 218–222. <https://doi.org/10.1097/01.nmd.0000202513.65079.1e>
- Auyong, D. B., Klein, S. M., Gan, T. J., Roche, A. M., Olson, D., & Habib, A. S. (2010). Processed electroencephalogram during donation after cardiac death. *Anesthesia and Analgesia*, 110(5), 1428–1432. <https://doi.org/10.1213/ANE.0b013e3181d27067>
- Bache, C. (2019). *LSD and the mind of the universe: Diamonds from heaven*. Simon and Schuster.
- Baird, B., Castelnuovo, A., Gosseries, O., & Tononi, G. (2018). Frequent lucid dreaming associated with increased functional connectivity between frontopolar cortex and temporoparietal association areas. *Scientific Reports* 2018 8:1, 8(1), 1–15. <https://doi.org/10.1038/s41598-018-36190-w>
- Bălăeț, M. (2022). Psychedelic Cognition—The Unreached Frontier of Psychedelic Science. *Frontiers in Neuroscience*, 0, 148. <https://doi.org/10.3389/FNINS.2022.832375>
- Barker, S. A., Borjigin, J., Lomnicka, I., & Strassman, R. (2013). LC/MS/MS analysis of the endogenous dimethyltryptamine hallucinogens, their precursors, and major metabolites in rat pineal gland microdialysate. *Biomedical Chromatography*, 27((12)), 1690–1700.
- Barker, S. A., McIlhenny, E. H., & Strassman, R. (2012). A critical review of reports of endogenous psychedelic N, N-dimethyltryptamines in humans: 1955-2010. *Drug Testing and Analysis*, 4(7–8), 617–635. <https://doi.org/10.1002/dta.422>

- Barrett, D. (1994). Dreams in dissociative disorders. *Dreaming*, 4(3), 165.
- Barrett, Deirdre. (1995). The dream character as prototype for the multiple personality alter. *Dissociation*, VIII(1), 61–68.
- Barrett, F. S., & Griffiths, R. R. (2018). Classic Hallucinogens and Mystical Experiences: Phenomenology and Neural Correlates. *Curr Top Behav Neurosci.*, 36, 393–430. https://doi.org/10.1007/7854_2017_474
- Barrett, F. S., Krimmel, S. R., Griffiths, R., Seminowicz, D. A., & Mathur, B. N. (2020). Psilocybin acutely alters the functional connectivity of the claustrum with brain networks that support perception, memory, and attention. *NeuroImage*, 218(April). <https://doi.org/10.1016/j.neuroimage.2020.116980>
- Barsuglia, J., Davis, A. K., Palmer, R., Lancelotta, R., Windham-Herman, A. M., Peterson, K., Polanco, M., Grant, R., & Griffiths, R. R. (2018). Intensity of mystical experiences occasioned by 5-MeO-DMT and comparison with a prior psilocybin study. *Frontiers in Psychology*, 9(DEC), 1–6. <https://doi.org/10.3389/fpsyg.2018.02459>
- Barsuglia, J. P., Polanco, M., Palmer, R., Malcolm, B. J., Kelmendi, B., & Calvey, T. (2018). A case report SPECT study and theoretical rationale for the sequential administration of ibogaine and 5-MeO-DMT in the treatment of alcohol use disorder. *Progress in Brain Research*, 242, 121–158. <https://doi.org/10.1016/BS.PBR.2018.08.002>
- Bartlett, G. (2022). Does integrated information theory make testable predictions about the role of silent neurons in consciousness? *Neuroscience of Consciousness*, 2022(1). <https://doi.org/https://doi.org/10.1093/nc/niac015>
- Bartolomei, F., Lagarde, S., Scavarda, D., Carron, R., Bénar, C. G., & Picard, F. (2019). The role of the dorsal anterior insula in ecstatic sensation revealed by direct electrical brain stimulation. *Brain Stim.*, 12(5), 1121–1126.
- Bayne, T., Hohwy, J., & Owen, A. M. (2016). Are There Levels of Consciousness? *Trends in Cognitive Sciences*, 20(6), 405–413. <https://doi.org/10.1016/J.TICS.2016.03.009>
- Beattie, J., & Berceles, D. (n.d.). *Global Case study: The effects of TRE on perceived stress, flourishing and chronic pain self-efficacy Evaluation of TRE training using Standard TRE*

- Protocol*. Retrieved April 4, 2022, from <https://traumaprevention.com/research/>
- Beauregard, M., Courtemanche, J., & Paquette, V. (2009). Brain activity in near-death experiencers during a meditative state. *Resuscitation, 80*(9), 1006–1010.
<https://doi.org/10.1016/j.resuscitation.2009.05.006>
- Becker, C. (1993). *Paranormal experience and survival of death*. SUNY Press, Albany, NY.
- Belanti, J., Perera, M., & Jagadheesan, K. (2008). Phenomenology of Near-death Experiences: A Cross-cultural Perspective. *Transcultural Psychiatry, 45*(1), 121–133.
<https://doi.org/10.1177/1363461507088001>
- Belser, A. B., Agin-Liebes, G., Swift, T. C., Terrana, S., Devenot, N., Friedman, H. L., Guss, J., Bossis, A., & Ross, S. (2017). Patient Experiences of Psilocybin-Assisted Psychotherapy: An Interpretative Phenomenological Analysis. *Journal of Humanistic Psychology, 57*(4), 354–388. <https://doi.org/10.1177/0022167817706884>
- Bértolo, H., Paiva, T., Pessoa, L., Mestre, T., Marques, R., & Santos, R. (2003). Visual dream content, graphical representation and EEG alpha activity in congenitally blind subjects. *Cognitive Brain Research, 15*(3), 277–284. [https://doi.org/10.1016/S0926-6410\(02\)00199-4](https://doi.org/10.1016/S0926-6410(02)00199-4)
- Bianco, S. (2017). *Living the death: death attitudes and representations after a near-death experience*. University of Padova, Padova, Italy.
- Bianco, S., Testoni, I., Palmieri, A., Solomon, S., & Hart, J. (2019). The Psychological Correlates of Decreased Death Anxiety After a Near-Death Experience: The Role of Self-Esteem, Mindfulness, and Death Representations. *Journal of Humanistic Psychology*.
<https://doi.org/10.1177/0022167819892107>
- Blackmore, S. J. (1993). *Dying to Live: Science and the Near-Death Experience*. Grafton, London.
- Blackmore, S. J. (1996a). Near-death experiences. In G. Stein (Ed.), *The Encyclopedia of the Paranormal* (pp. 425–441). Prometheus Books, Amherst, NY.
- Blackmore, S. J. (1996b). Out-of-body experiences. In G. Stein (Ed.), *The Encyclopedia of the Paranormal* (pp. 471–483). Prometheus Books, Amherst, NY.

- Blackmore, S. (1998). Experiences of anoxia: Do reflex anoxic seizures resemble near-death experiences? *Journal of Near-Death Studies*, 17(2). <https://doi.org/10.17514/jnds-1998-17-2-p111-120>.
- Blackmore, S. (2020). *In Praise of Psychedelics | How LSD changed one psychologist's life*. Psychology Today. <https://www.psychologytoday.com/gb/blog/ten-zen-questions/202001/in-praise-psychedelics>
- Blackmore, S., & Cox, M. (2000). Alien Abductions, Sleep Paralysis and the Temporal Lobe. *European Journal of UFO and Abduction Studies*, 1, 113–118.
- Blanke, O., Landis, T., Spinelli, L., & Seeck, M. (2004). Out-of-body experience and autoscapy of neurological origin. *Brain*, 127(2), 243–258. <https://doi.org/10.1093/brain/awh040>
- Blanke, O., Faivre, N., & Dieguez, S. (2015). Leaving Body and Life Behind: Out-of-Body and Near-Death Experience. Out-of-Body and Near-Death Experience. In S. Laureys, O. Gosseries, & G. Tononi (Eds.), *The Neurology of Consciousness: Cognitive Neuroscience and Neuropathology* (pp. 323–347). Academic Press. <https://doi.org/10.1016/B978-0-12-800948-2.00020-0>
- Boly, M., Seth, A. K., Wilke, M., Ingmundson, P., Baars, B., Laureys, S., Edelman, D. B., & Tsuchiya, N. (2013). Consciousness in humans and non-human animals: Recent advances and future directions. *Frontiers in Psychology*, 4(OCT), 1–20. <https://doi.org/10.3389/FPSYG.2013.00625/BIBTEX>
- Bonhomme, V., Vanhaudenhuyse, A., Demertzi, A., Bruno, M. A., Jaquet, O., Bahri, M. A., Plenevaux, A., Boly, M., Boveroux, P., Soddu, A., Bricchant, J. F., Maquet, P., & Laureys, S. (2016). Resting-state Network-specific Breakdown of Functional Connectivity during Ketamine Alteration of Consciousness in Volunteers. *Anesthesiology*, 125(5), 873–888. <https://doi.org/10.1097/ALN.0000000000001275>
- Borjigin, J., & Chavez, J. (n.d.). *Interview with Leading DMT Researcher Dr. Jimo Borjigin – DMT QUEST*. Dmtquest.Org. Retrieved August 5, 2022, from <https://dmtquest.org/interview-with-leading-dmt-researcher-dr-jimo-borjigin/>
- Borjigin, J., Lee, U. C., Liu, T., Pal, D., Huff, S., Klarr, D., Sloboda, J., Hernandez, J., Wang, M. M., & Mashour, G. A. (2013). Surge of neurophysiological coherence and connectivity in

- the dying brain. *Proceedings of the National Academy of Sciences of the United States of America*, 110(35), 14432–14437. <https://doi.org/10.1073/pnas.1308285110>
- Boszormenyi, Z., & Szara, S. (1958). Dimethyltryptamine Experiments with Psychotics. *Central State Institute of Nervous and Mental Diseases*, 104(435), 445–453.
- Braden, W. (1969). *The private sea: LSD and the search for God*. Pall Mall Press.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Brinkley, D. (2008). *Saved by the light*. Harper One.
- Britton, W. B., & Bootzin, R. R. (2004). Near-Death Experiences and the Temporal Lobe. *Psychological Science*, 15(4), 254–258. <https://doi.org/10.1111/j.0956-7976.2004.00661.x>
- Broicher, S. D., Kuchukhidze, G., Grunwald, T., Krämer, G., Kurthen, M., & Jokeit, H. (2012). “Tell me how do I feel” - Emotion recognition and theory of mind in symptomatic mesial temporal lobe epilepsy. *Neuropsychologia*, 50(1), 118–128. <https://doi.org/10.1016/j.neuropsychologia.2011.11.005>
- Brugger, P., & Mohr, C. (2008). The paranormal mind: How the study of anomalous experiences and beliefs may inform cognitive neuroscience. *Cortex*, 44(10), 1291.
- Buchborn, T. (2019). Using Optogenetics to Shine a Light on the Motor-Cortical Embedding of the Mammalian “Psychedelic Signature Move.” *Breaking Convention: The 5th International Conference on Psychedelic Consciousness, University of Greenwich, London, UK*.
- Buzsáki, G., & Moser, E. I. (2013). Memory, navigation and theta rhythm in the hippocampal-entorhinal system. *Nat. Neurosci.*, 16, 130–138. <https://doi.org/10.1038/nn.330>
- Cahill, L., & Alkire, M. T. (2003). Epinephrine enhancement of human memory consolidation: Interaction with arousal at encoding. *Neurobiology of Learning and Memory*, 79(2), 194–198. [https://doi.org/10.1016/S1074-7427\(02\)00036-9](https://doi.org/10.1016/S1074-7427(02)00036-9)
- Carbonaro, T. M., & Gatch, M. B. (2016). Neuropharmacology of N,N-Dimethyltryptamine. *Brain Res Bull.*, 126, 74–88.

<https://doi.org/10.1016/j.brainresbull.2016.04.016.Neuropharmacology>

Carhart-Harris, R. (2007). Waves of the unconscious: The neurophysiology of dreamlike phenomena and its implications for the psychodynamic model of the mind.

Neuropsychoanalysis, 9(2), 183–211.

<https://doi.org/10.1080/15294145.2007.10773557>

Carhart-Harris, R. L., & Friston, K. J. (2010). The default-mode, ego-functions and free-energy: a neurobiological account of Freudian ideas. *Brain*, 133(4), 1265–1283.

<https://doi.org/10.1093/BRAIN/AWQ010>

Carhart-Harris, Robin L., Erritzoe, D., Williams, T., Stone, J. M., Reed, L. J., Colasanti, A., Tyacke, R. J., Leech, R., Malizia, A. L., Murphy, K., Hobden, P., Evans, J., Feilding, A., Wise, R. G., & Nutt, D. J. (2012). Neural correlates of the psychedelic state as determined by fMRI studies with psilocybin. *Proceedings of the National Academy of Sciences of the United States of America*, 109(6), 2138–2143.

<https://doi.org/10.1073/pnas.1119598109>

Carhart-Harris, Robin L., Leech, R., Erritzoe, D., Williams, T. M., Stone, J. M., Evans, J., Sharp, D. J., Feilding, A., Wise, R. G., & Nutt, D. J. (2013). Functional Connectivity Measures After Psilocybin Inform a Novel Hypothesis of Early Psychosis. *Schizophrenia Bulletin*, 39(6), 1343–1351. <https://doi.org/10.1093/SCHBUL/SBS117>

Carhart-Harris, Robin L., Leech, R., Hellyer, P. J., Shanahan, M., Feilding, A., Tagliazucchi, E., Chialvo, D. R., & Nutt, D. (2014). The entropic brain: A theory of conscious states informed by neuroimaging research with psychedelic drugs. *Frontiers in Human Neuroscience*, 8(1 FEB), 1–22. <https://doi.org/10.3389/fnhum.2014.00020>

Carhart-Harris, Robin L., Muthukumaraswamy, S., Roseman, L., Kaelen, M., Droog, W., Murphy, K., Tagliazucchi, E., Schenberg, E. E., Nest, T., Orban, C., Leech, R., Williams, L. T., Williams, T. M., Bolstridge, M., Sessa, B., McGonigle, J., Sereno, M. I., Nichols, D., Hellyer, P. J., ... Nutt, D. J. (2016). Neural correlates of the LSD experience revealed by multimodal neuroimaging. *Proceedings of the National Academy of Sciences of the United States of America*, 113(17), 4853–4858.

<https://doi.org/10.1073/pnas.1518377113>

- Carhart-Harris, R. L., & Nutt, D. J. (2017). Serotonin and brain function: A tale of two receptors. *Journal of Psychopharmacology*, *31*(9), 1091–1120.
<https://doi.org/10.1177/0269881117725915>
- Carhart-Harris, R L, Erritzoe, & D., Haijen, E., Kaelen, & M., & Watts, & R. (2018). Psychedelics and connectedness. *Psychopharmacology*, *235*, 547–550.
<https://doi.org/10.1007/s00213-017-4701-y>
- Carhart-Harris, Robin L. (2018). The entropic brain - revisited. *Neuropharmacology*, *142*, 167–178. <https://doi.org/10.1016/j.neuropharm.2018.03.010>
- Carhart-Harris, R. L., & Friston, K. J. (2019). REBUS and the anarchic brain: Toward a unified model of the brain action of psychedelics. *Pharmacological Reviews*, *71*(3), 316–344.
<https://doi.org/10.1124/pr.118.017160>
- Carhart-Harris, Robin L. (2019). How do psychedelics work? *Current Opinion in Psychiatry*, *32*(1), 16–21. <https://doi.org/10.1097/YCO.0000000000000467>
- Carlson, A. P., Shuttleworth, C. W., Major, S., Lemale, C. L., Dreier, J. P., & Hartings, J. A. (2019). Terminal spreading depolarizations causing electrocortical silencing prior to clinical brain death: Case report. *Journal of Neurosurgery*, *131*(6), 1773–1779.
<https://doi.org/10.3171/2018.7.JNS181478>
- Carpenter, J. C. (2004). First sight: Part one, a model of psi and the mind. *Journal of Parapsychology*, *68*(2), 217.
- Carpenter, J. C. (2015). *First sight: ESP and parapsychology in everyday life*. Rowman & Littlefield.
- Carr, B. (2022). Making space and time for mind and psychedelia. In *DMT Entity Encounters: Dialogues on the spirit molecule*. Simon and Schuster.
- Casali, A. G., Gosseries, O., Rosanova, M., Boly, M., Sarasso, S., Casali, K. R., Casarotto, S., Bruno, M. A., Laureys, S., Tononi, G., & Massimini, M. (2013). A theoretically based index of consciousness independent of sensory processing and behavior. *Science Translational Medicine*, *5*(198).
https://doi.org/10.1126/SCITRANSLMED.3006294/SUPPL_FILE/5-198RA105_SM.PDF

- Case, J. (2003). The community K-hole. *Entheogen Review*, 12(2), 58.
- Cassol, H., Pétré, B., Degrange, S., Martial, C., Charland-Verville, V., Lallier, F., Bragard, I., Guillaume, M., & Laureys, S. (2018). Qualitative thematic analysis of the phenomenology of near-death experiences. *PLoS ONE*, 13(2), 1–14. <https://doi.org/10.1371/journal.pone.0193001>
- Cassol, H., Martial, C., Annen, J., Martens, G., Charland-Verville, V., Majerus, S., & Laureys, S. (2019). A systematic analysis of distressing near-death experience accounts. *Memory*, 27(8), 1122–1129. <https://doi.org/10.1080/09658211.2019.1626438>
- Chari, C. T. K. (1982). Parapsychological reflections on some tunnel experiences. *Anabiosis*, 2, 110–113.
- Charland-Verville, V., Jourdan, J. P., Thonnard, M., Ledoux, D., Donneau, A. F., Quertemont, E., & Laureys, S. (2014). Near-death experiences in non-life-threatening events and coma of different etiologies. *Frontiers in Human Neuroscience*, 8(MAY), 1–8. <https://doi.org/10.3389/fnhum.2014.00203>
- Charland-Verville, V., Lugo, Z., Jourdan, J. P., Donneau, A. F., & Laureys, S. (2015). Near-Death Experiences in patients with locked-in syndrome: Not always a blissful journey. *Consciousness and Cognition*, 34, 28–32. <https://doi.org/10.1016/j.concog.2015.03.011>
- Charland-Verville, V., de Paula, D. R., Martial, C., Cassol, H., Antonopoulos, G., Chronik, B. A., Soddu, A., & Laureys, S. (2020). Characterization of near death experiences using text mining analyses: A preliminary study. *PLoS ONE*, 15(1), 1–13. <https://doi.org/10.1371/journal.pone.0227402>
- Charles Nichols, & David Nichols. (2020). DMT in the Mammalian Brain: A Critical Appraisal. *ALIUS Bulletin*, 4, 16–22. <https://doi.org/https://doi.org/10.34700/s66k-9j57>
- Chawla, L. S., Akst, S., Junker, C., Jacobs, B., & Seneff, M. G. (2009). Surges of electroencephalogram activity at the time of death: A case series. *Journal of Palliative Medicine*, 12(12), 1095–1100. <https://doi.org/10.1089/jpm.2009.0159>
- Chawla, L. S., Terek, M., Junker, C., Akst, S., Yoon, B., Brasha-Mitchell, E., & Seneff, M. G. (2017). Characterization of end-of-life electroencephalographic surges in critically ill

- patients. *Death Studies*, 41(6), 385–392.
<https://doi.org/10.1080/07481187.2017.1287138>
- Clute, H., & Levy, W. (1990). Electroencephalographic changes during brief cardiac arrest in humans. *Anesthesiology*, 73, 821–825.
- Coles, A. (2013). Temporal lobe epilepsy and Dostoyevsky seizures: Neuropathology and Spirituality. *Royal College of Psychiatrists Spirituality Special Interest Group*.
- Corazza, O. (2008). *Near-death experiences: Exploring the mind-body connection*. Routledge.
- Cormier, Z. (2018, October 30). *DMT Is the Drug for Our Collective Crisis of Meaning – Zoe Cormier*. Zoecormier.Com. <http://zoecormier.com/2018/10/30/dmt-is-the-drug-for-our-collective-crisis-of-meaning/>
- Cott, C., & Rock, A. (2008). Phenomenology of N,N-Dimethyltryptamine use : a thematic analysis. *Journal of Scientific Exploration*, 22(3), 359–370.
- Cowan, J. (2013). A model of how geometric hallucinations are generated in the brain. *Invited Lecture for the Imperial College and Beckley Foundation Conference on Scientific Research with Psychedelic Drugs, Imperial College, June 12*.
- Cristofori, I., Bulbulia, J., Shaver, J. H., Wilson, M., Krueger, F., & Grafman, J. (2016). Neural correlates of mystical experience. *Neuropsychologia*, 80, 212–220.
<https://doi.org/10.1016/j.neuropsychologia.2015.11.021>
- D’Souza, D. (2021). *Fixed Order, Open-Label, Dose-Escalation Study of DMT in Humans (NCT04711915)* . ClinicalTrials.Gov.
<https://clinicaltrials.gov/ct2/show/NCT04711915?term=d%27souza+dmtd&draw=2&rank=1>
- Dakwar, E., Nunes, E. V., Hart, C. L., Foltin, R. W., Mathew, S. J., Carpenter, K. M., Choi, C. J., Basaraba, C. N., Pavlicova, M., & Levin, F. R. (2019). A single ketamine infusion combined with mindfulness-based behavioral modification to treat cocaine dependence: A randomized clinical trial. *American Journal of Psychiatry*, 176(11), 923–930. <https://doi.org/10.1176/appi.ajp.2019.18101123>
- Damasio, A. (2021). *Feeling & knowing: Making minds conscious*. Pantheon.

- Danielson, N. B., Guo, J. N., & Blumenfeld, H. (2011). The default mode network and altered consciousness in epilepsy. *Behavioural Neurology, 24*(1), 55–65.
<https://doi.org/10.3233/BEN-2011-0310>
- Davis, A. K., So, S., Lancelotta, R., Barsuglia, J. P., & Griffiths, R. R. (2019). 5-methoxy-N,N-dimethyltryptamine (5-MeO-DMT) used in a naturalistic group setting is associated with unintended improvements in depression and anxiety. *American Journal of Drug and Alcohol Abuse, 45*(2), 161–169. <https://doi.org/10.1080/00952990.2018.1545024>
- Davis, A. K., Barrett, F. S., & Griffiths, R. R. (2020). Psychological flexibility mediates the relations between acute psychedelic effects and subjective decreases in depression and anxiety. *Journal of Contextual Behavioral Science, 15*(October 2019), 39–45.
<https://doi.org/10.1016/j.jcbs.2019.11.004>
- Davis, A. K., Clifton, J. M., Weaver, E. G., Hurwitz, E. S., Johnson, M. W., & Griffiths, R. R. (2020). Survey of entity encounter experiences occasioned by inhaled N,N-dimethyltryptamine: Phenomenology, interpretation, and enduring effects. *Journal of Psychopharmacology, 34*(9), 1008–1020. <https://doi.org/10.1177/0269881120916143>
- Davis, A. K., Barrett, F. S., So, S., Gukasyan, N., Swift, T. C., & Griffiths, R. R. (2021). Development of the Psychological Insight Questionnaire among a sample of people who have consumed psilocybin or LSD. *Journal of Psychopharmacology*.
<https://doi.org/10.1177/0269881120967878>
- de Almeida, R. N., Galvão, A. C. de M., da Silva, F. S., Silva, E. A. dos S., Palhano-Fontes, F., Maia-de-Oliveira, J. P., de Araújo, D. B., Lobão-Soares, B., & Galvão-Coelho, N. L. (2019). Modulation of serum brain-derived neurotrophic factor by a single dose of ayahuasca: Observation from a randomized controlled trial. *Frontiers in Psychology, 10*(JUN), 1–13.
<https://doi.org/10.3389/fpsyg.2019.01234>
- Dean, J. G. (2018). Indolethylamine-N-methyltransferase polymorphisms: Genetic and biochemical approaches for study of endogenous N, N,-dimethyltryptamine. *Frontiers in Neuroscience, 12*(APR). <https://doi.org/10.3389/fnins.2018.00232>
- Dean, J. G., Liu, T., Huff, S., Sheler, B., Barker, S. A., Strassman, R. J., Wang, M. M., & Borjigin, J. (2019). Biosynthesis and Extracellular Concentrations of N,N-dimethyltryptamine

(DMT) in Mammalian Brain. *Scientific Reports*, 9(1), 1–11.

<https://doi.org/10.1038/s41598-019-45812-w>

Devlin, F., & Bhatt, N. (2022, September 23). *SPL026 With or Without SSRIs in Participants With MDD - Full Text View - ClinicalTrials.gov*.

<https://clinicaltrials.gov/ct2/show/NCT05553691?term=small+pharma&cond=dmtd&draw=2&rank=2>

dos Santos, R. G., Enyart, S., Bouso, J. C., Pares, Ò., & Hallak, J. E. C. (2018). “Ayahuasca turned on my mind’s eye”: Enhanced visual imagery after ayahuasca intake in a man with “blind imagination” (aphantasia). *Journal of Psychedelic Studies*, 2(2), 74–77.

<https://doi.org/10.1556/2054.2018.008>

Dos Santos, R. G., Sanches, R. F., Osório, F. D. L., & Hallak, J. E. C. (2018). Long-term effects of ayahuasca in patients with recurrent depression: A 5-year qualitative follow-up.

Revista de Psiquiatria Clinica, 45(1), 22–24. <https://doi.org/10.1590/0101-60830000000149>

Doss, M. K., May, D. G., Johnson, M. W., Clifton, J. M., Hedrick, S. L., Prisinzano, T. E., Griffiths, R. R., & Barrett, F. S. (2020). The Acute Effects of the Atypical Dissociative Hallucinogen Salvinorin A on Functional Connectivity in the Human Brain. *Scientific Reports*, 10(1), 1–12. <https://doi.org/10.1038/s41598-020-73216-8>

Dowling, M. (2006). Approaches to reflexivity in qualitative research. *Nurse Researcher*, 13(3).

Drab, K. J. (1981). The tunnel experience: Reality or hallucination? *Anabiosis*, 1, 126–152.

Dreier, J. P., Major, S., Foreman, B., Winkler, M. K. L., Kang, E. J., Milakara, D., Lemale, C. L., DiNapoli, V., Hinzman, J. M., Woitzik, J., Andaluz, N., Carlson, A., & Hartings, J. A. (2018). Terminal spreading depolarization and electrical silence in death of human cerebral cortex. *Annals of Neurology*, 83(2), 295–310.

<https://doi.org/10.1002/ana.25147>

Dupuis, D. (2021). Psychedelics as Tools for Belief Transmission. Set, Setting, Suggestibility, and Persuasion in the Ritual Use of Hallucinogens. *Frontiers in Psychology*, 12, 5486.

<https://doi.org/10.3389/FPSYG.2021.730031/BIBTEX>

- Dutta, V. (2012). Repression of death consciousness and the psychedelic trip. *Journal of Cancer Research and Therapeutics*, 8(3), 336–342. <https://doi.org/10.4103/0973-1482.103509>
- Eliade, M. (1951). *Shamanism: Archaic Techniques of Ecstasy*. Librarie Payot.
- Elliott, R., Fischer, C. T., & Rennie, D. L. (1999). Evolving guidelines for publication of qualitative research studies in psychology and related fields. *The British Journal of Clinical Psychology*, 38(3), 215–229.
- Ermakova, A. O., Dunbar, F., Rucker, J., & Johnson, M. W. (2022). A narrative synthesis of research with 5-MeO-DMT. *Journal of Psychopharmacology*, 36(3), 273–294. <https://doi.org/10.1177/02698811211050543>
- Erritzoe, D., Roseman, L., Nour, M. M., MacLean, K., Kaelen, M., Nutt, D. J., & Carhart-Harris, R. L. (2018). Effects of psilocybin therapy on personality structure. *Acta Psychiatrica Scandinavica*, 138(5), 368–378. <https://doi.org/10.1111/acps.12904>
- Erritzoe, D., Boyce, M., & Devlin, F. (2020, December 17). *SPL026 (DMT Fumarate) in Healthy Subjects and MDD Patients*. ClinicalTrials.Gov. <https://clinicaltrials.gov/ct2/show/NCT04673383?term=small+pharma&cond=dmtd&draw=2&rank=1>
- Evans-Wentz, W. (1911). *The Fairy-Faith in Celtic Countries*. H. Frowde.
- Evans Bush, N. (2009). Distressing Western near- death experiences: Finding a way through the abyss. In J. M. Holden, B. Greyson, & D. James (Eds.), *The handbook of near- death experiences: Thirty years of investigation* (pp. 63–86). Praeger/ABC- CLIO.
- Facco, E., & Agrillo, C. (2012). Near-death-like experiences without life-threatening conditions or brain disorders: A hypothesis from a case report. *Frontiers in Psychology*, 3(NOV), 1–6. <https://doi.org/10.3389/fpsyg.2012.00490>
- Family, N., Maillet, E. L., Williams, L. T. J., Krediet, E., Carhart-Harris, R. L., Williams, T. M., Nichols, C. D., Goble, D. J., & Raz, S. (2020). Safety, tolerability, pharmacokinetics, and pharmacodynamics of low dose lysergic acid diethylamide (LSD) in healthy older volunteers. *Psychopharmacology*, 237(3), 841–853. <https://doi.org/10.1007/S00213->

- Filevich, E., Dresler, M., Brick, T. R., & Kühn, S. (2015). Metacognitive Mechanisms Underlying Lucid Dreaming. *Journal of Neuroscience*, *35*(3), 1082–1088. <https://doi.org/10.1523/JNEUROSCI.3342-14.2015>
- First, M., Williams, J., Spitzer, R., & Gibbon, M. (2007). *Structured clinical interview for DSM-IV-TR axis I disorders, clinical trials version (SCID-CT)*. Biometrics Research, New York State Psychiatric Institute.
- French, C. C. (2005). Near-death experiences in cardiac arrest survivors. *Progress in Brain Research*, *150*, 351–367. [https://doi.org/10.1016/S0079-6123\(05\)50025-6](https://doi.org/10.1016/S0079-6123(05)50025-6)
- Frenk, H., McCarty, B. C., & Liebeskind, J. C. (1978). Different brain areas mediate the analgesic and epileptic properties of enkephalin. *Science*, *200*, 335–337.
- Friston, K., Kilner, J., & Harrison, L. (2006). A free energy principle for the brain. *Journal of Physiology-Paris*, *100*(1–3), 70–87. <https://doi.org/10.1016/J.JPHYSPARIS.2006.10.001>
- Frith, C. D., & Frith, U. (2000). *The physiological basis of theory of mind: Functional neuroimaging studies*. <https://www.researchgate.net/publication/285849221>
- Gabbard, G. O., Twemlow, S. W., and Jones, F. C. (1981). Do “near death experiences” occur only near death? *J. Nerv. Ment. Dis.*, *169*(374–377).
- Gabbard, G., & Twemlow, S. (1991). Do “near-death experiences” occur only near-death?- Revisited. *J. Near Death Stud.*, *10*, 41–47.
- Gaia, G. (2016). *Changa’s Alchemy: Narratives of Transformation in Psychedelic Experiences*. University of Amsterdam.
- Gaia, G. (2017, July 18). *Giorgia Gaia - Changa’s Alchemy*. YouTube. <https://www.youtube.com/watch?v=eKFx56GMBN8>
- Gaiseanu, F. (2017). Quantum-assisted process of disembodiment under near- death conditions: an informational-field support model. *NeuroQuantology*, *15*, 10–7.
- Gallimore, Andrew R. (2013). Building alien worlds- The neuropsychological and evolutionary implications of the astonishing psychoactive effects of N,N-

- dimethyltryptamine (DMT). *Journal of Scientific Exploration*, 27(3), 455–503.
- Gallimore, Andrew R. (2015). Restructuring consciousness -The psychedelic state in light of integrated information theory. *Frontiers in Human Neuroscience*, 9(June), 346.
<https://doi.org/10.3389/FNHUM.2015.00346/XML/NLM>
- Gallimore, Andrew R, & Luke, D. P. (2015). *DMT research from 1956 to the edge of time*. 291–316.
http://www.academia.edu/download/39251651/DMT_Research_from_1956_to_the_Edge_ofTime.pdf
- Gallimore, Andrew R., & Strassman, R. J. (2016). A model for the application of target-controlled intravenous infusion for a prolonged immersive DMT psychedelic experience. *Frontiers in Pharmacology*, 7(JUL), 1–11. <https://doi.org/10.3389/fphar.2016.00211>
- Gallimore, A. R. (2019). *Alien Information Theory: Psychedelic Drug Technologies and the Cosmic Game*. Strange Worlds Press.
- Gallimore, A. (2020, May). *Psychedelics and the Brain Master Course*. Youtube.
<https://www.youtube.com/playlist?list=PLbqdD4EM-aEfmLvbWu8GQDhUII236Mzf->
- Gandy, S. (2017). Dying to live: The power of transcendence in the treatment of existential anxiety. *Journal of Interdisciplinary Consciousness Studies*, 1(2), 25–36.
- Gardner, H. E. (2000). *Intelligence reframed: Multiple intelligences for the 21st century*. Basic Books, NY.
- Gasser, P., Kirchner, K., & Passie, T. (2015). LSD-assisted psychotherapy for anxiety associated with a life-threatening disease: A qualitative study of acute and sustained subjective effects. *Journal of Psychopharmacology*, 29(1), 57–68.
<https://doi.org/10.1177/0269881114555249>
- Gilligan, J. (2021). *Open-label Study to Assess the Safety and Efficacy of TRP-8802 With Psychotherapy in Adult Participants With Fibromyalgia (NCT05128162)*. ClinicalTrials.Gov.
<https://www.clinicaltrials.gov/ct2/show/NCT05128162?term=psychedelic&cond=Fibromyalgia&draw=2&rank=1>

- Gordon, W. Van, Griffiths, M. D., & Gordon, W. Van. (2018). *Meditation-Induced Near-Death Experiences : a 3-Year Longitudinal Study*. 1794–1806.
- Gosseries, O., & Martial, C. (2020). The Use of Psychedelics in the Treatment of Disorders of Consciousness. *Aluis Bulletin*, 4.
- Grey, A. (2004). *Transfigurations*. Inner Traditions.
- Greyson, Bruce. (1981). Near-Death Experiences and Attempted Suicide. *Suicide and Life-Threatening Behavior*, 11(1), 10–16. <https://doi.org/10.1111/J.1943-278X.1981.TB00995.X>
- Greyson, B. (1983). Increase in psychic phenomena following near-death experiences. *Theta*, 2(11), 26–29.
- Greyson, Bruce. (1983). The near-death experience scale: Construction, reliability, and validity. *Journal of Nervous and Mental Disease*, 171(6), 369–375. <https://doi.org/10.1097/00005053-198306000-00007>
- Greyson, Bruce. (1992). Reduced death threat in near-death experiencers. *Death Studies*, 16(6), 523–536. <https://doi.org/10.1080/07481189208252596>
- Greyson, Bruce, & Evans Bush, N. (1992). Distressing Near-Death Experiences. *Psychiatry*, 55(1), 95–110. <https://doi.org/10.1080/00332747.1992.11024583>
- Greyson, B. (1998). Biological aspects of near-death experiences. *Perspectives in Biology and Medicine*, 42(1), 14–32.
- Greyson, Bruce. (2000). Dissociation in people who have near-death experiences: out of their bodies or out of their minds? *The Lancet*, 355(9202), 460–463.
- Greyson, Bruce. (2001). Posttraumatic Stress Symptoms Following Near-Death Experiences. *American Journal of Orthopsychiatry*, 71(3), 368–373. <https://doi.org/10.1037/0002-9432.71.3.368>
- Greyson, Bruce. (2003). Incidence and correlates of near-death experiences in a cardiac care unit. *General Hospital Psychiatry*, 25(4), 269–276. [Page 371 of 498](https://doi.org/10.1016/S0163-</p></div><div data-bbox=)

- Greyson, B. (2006). Near-death experiences and spirituality. *Zygon*[®], *41*(2), 393–414.
- Greyson, Bruce, Holden, J. M., & Paul Mounsey, J. (2006). Failure to Elicit Near-Death Experiences in Induced Cardiac Arrest. *Journal of Near-Death Studies*, *25*(2).
<https://doi.org/https://doi.org/10.17514/JNDS-2006-25-2-p85-98>
- Greyson, Bruce. (2007). Consistency of near-death experience accounts over two decades: Are reports embellished over time? *Resuscitation*, *73*(3), 407–411.
<https://doi.org/10.1016/J.RESUSCITATION.2006.10.013>
- Greyson, Bruce. (2010). Seeing dead people not known to have died: “Peak in Darien” experiences. *Anthropology and Humanism*, *35*(2), 159–171.
<https://doi.org/10.1111/j.1548-1409.2010.01064.x>
- Greyson, Bruce. (2014). Congruence Between Near-Death and Mystical Experience. *International Journal for the Psychology of Religion*, *24*(4), 298–310.
<https://doi.org/10.1080/10508619.2013.845005>
- Greyson, Bruce, Fountain, N. B., Derr, L. L., & Broshek, D. K. (2014). Out-of-body experiences associated with seizures. *Frontiers in Human Neuroscience*, *8*(1 FEB), 1–11.
<https://doi.org/10.3389/fnhum.2014.00065>
- Greyson, Bruce, & Khanna, S. (2014a). Spiritual transformation after near-death experiences. *Spirituality in Clinical Practice*, *1*(1), 43–55.
<https://doi.org/10.1037/SCP0000010>
- Greyson, Bruce, & Khanna, S. (2014b). Spiritual transformation after near-death experiences. *Spirituality in Clinical Practice*, *1*(1), 43–55.
<https://doi.org/10.1037/SCP0000010>
- Greyson, Bruce. (2021). *After: A Doctor Explores What Near-Death Experiences Reveal about Life and Beyond*. St. Martin’s Essentials.
- Griffiths, R. R., Richards, W. A., McCann, U., & Jesse, R. (2006). Psilocybin can occasion mystical-type experiences having substantial and sustained personal meaning and spiritual significance. *Psychopharmacology*, *187*(3), 268–283.

<https://doi.org/10.1007/s00213-006-0457-5>

Griffiths, R. R., Richards, W. A., Johnson, M. W., McCann, U. D., & Jesse, R. (2008). Mystical-type experiences occasioned by psilocybin mediate the attribution of personal meaning and spiritual significance 14 months later. *Journal of Psychopharmacology*, *22*(6), 621–632. <https://doi.org/10.1177/0269881108094300>

Griffiths, Roland R., Hurwitz, E. S., Davis, A. K., Johnson, M. W., & Jesse, R. (2019). Survey of subjective “God encounter experiences”: Comparisons among naturally occurring experiences and those occasioned by the classic psychedelics psilocybin, LSD, ayahuasca, or DMT. *PLoS ONE*, *14*(4). <https://doi.org/10.1371/journal.pone.0214377>

Griffiths, Roland R. (2022). Psilocybin-occasioned mystical-type experiences: implications for consciousness, altruism, and spirituality. *Interdisciplinary Conference on Psychedelic Research, Sep 22nd-24th*.

Grinspoon, L., & Bakalar, J. (1979). *Psychedelic drugs reconsidered*. Basic Books.

Grof, Stanislav. (1973). Theoretical and empirical basis of transpersonal psychology and psychotherapy: Observations from LSD research - ProQuest. *The Journal of Transpersonal Psychology*, *5*(1).

Grof, Stanislav. (1985). *Beyond the Brain Birth, Death, and Transcendence in Psychotherapy*. State University of New York Press.

Grof, S. (1994). Alternative cosmologies and altered states. *Noetic Sciences Review*, *32*(21).

Grof, Stanislav. (2007). *Psychology of the Future (expanded paper)*. *3*, 351–367.

Groth-Marnat, G., & Summers, R. (1998). Altered beliefs, attitudes, and behaviors following near-death experiences. *Journal of Humanistic Psychology*, *38*(3), 110–125. <https://doi.org/10.1177/00221678980383005>

Haijen, E. C. H. M., Kaelen, M., Roseman, L., Timmermann, C., Kettner, H., Russ, S., Nutt, D., Daws, R. E., Hampshire, A. D. G., Lorenz, R., & Carhart-Harris, R. L. (2018). Predicting Responses to Psychedelics: A Prospective Study. *Frontiers in Pharmacology*, *9*(NOV), 897. <https://doi.org/10.3389/fphar.2018.00897>

Halberstadt, A. L., Nichols, D. E., & Vollenweider, F. X. (2018). Behavioral Neurobiology of

- Psychedelic Drugs. In *Current Topics in Behavioral Neurosciences*. Springer.
<http://www.springer.com/series/7854>
- Hameroff, S., & Penrose, R. (1996). Orchestrated reduction of quantum coherence in brain microtubules: A model for consciousness. *Mathematics and Computers in Simulation*, 40(3–4), 453–480. [https://doi.org/10.1016/0378-4754\(96\)80476-9](https://doi.org/10.1016/0378-4754(96)80476-9)
- Hameroff, S., & Chopra, D. (2012). The “quantum soul”: A scientific hypothesis. *Exploring Frontiers of the Mind-Brain Relationship*, 79–93. https://doi.org/10.1007/978-1-4614-0647-1_5/COVER
- Hameroff, S. (2017). Neuroscience: Anesthesia and consciousness. *UCL Society for the Application of Psychedelics, University College, London UK, Oct 31, 2017*.
- Hampe, C. (1975). *Sterbern ist doch ganz anders [To Die is Gain]*. Kreuz Verlag Stuttgart.
- Hancock, G. (2005). *Supernatural: Meetings with the ancient teachers of mankind*. Century.
- Harris, S. (2014). *Waking up: A guide to spirituality without religion*. Simon and Schuster.
- Hartogsohn, I. (2016). Set and setting, psychedelics and the placebo response: An extra-pharmacological perspective on psychopharmacology. *Journal of Psychopharmacology*, 30(12), 1259–1267. <https://doi.org/10.1177/0269881116677852>
- Hayes, S. C., & Wilson, K. G. (2017). Acceptance and Commitment Therapy: Altering the Verbal Support for Experiential Avoidance. *The Behavior Analyst 1994*, 17(2), 289–303. <https://doi.org/10.1007/BF03392677>
- Heim, A. (1891). Notizen uber den Tod durch Absturz [Notes on death by falling]. *Jahrbuch Des Schweizer Alpenclub [Yearbook of the Swiss Alpine Club]*, 27, 327–337.
- Hendricks, P. (2021). *Psilocybin-facilitated Treatment for Chronic Pain (NCT05068791)*. ClinicalTrials.Gov.
<https://www.clinicaltrials.gov/ct2/show/NCT05068791?term=psychedelic&cond=Fibromyalgia&draw=2&rank=4>
- Herzog, R., Mediano, P. A. M., Rosas, F. E., Carhart-Harris, R., Perl, Y. S., Tagliazucchi, E., & Cofre, R. (2020). A mechanistic model of the neural entropy increase elicited by psychedelic drugs. *Scientific Reports 2020 10:1*, 10(1), 1–12.

<https://doi.org/10.1038/s41598-020-74060-6>

Hick, J. (1976). *Death and Eternal Life*. Collins, London.

High Times Greats: Interview With Albert Hofmann, The Man Who First Synthesized LSD.

(2020). High Times. <https://hightimes.com/culture/albert-hofmann-lsd-interview/>

Hillman, J. (1979). *The Dream and the Underworld*. Harper & Row, New York.

Hoepner, R., Labudda, K., May, T. W., Schoendienst, M., Woermann, F. G., Bien, C. G., & Brandt, C. (2013). Ictal autoscopic phenomena and near death experiences: A study of five patients with ictal autoscopies. *Journal of Neurology*, *260*(3), 742–749.

<https://doi.org/10.1007/s00415-012-6689-x>

Holden, Janice Miner, & Joesten, L. (1990). Near-death veridicality research in the hospital setting: Problems and promise. *Journal of Near-Death Studies* *1990* 9:1, *9*(1), 45–54.

<https://doi.org/https://doi.org/10.17514/JNDS-1990-9-1-p45-54>

Holden, J. (2009). Veridical perception in near-death experiences. In J. M. Holden, B.

Greyson, & D. James (Eds.), *The handbook of near-death experiences: Thirty years of investigation* (pp. 185–211). Praeger/ABC-CLIO.

Horváth, L., Szummer, C., & Szabo, A. (2018). Weak phantasy and visionary phantasy: the phenomenological significance of altered states of consciousness. *Phenomenology and the Cognitive Sciences*, *17*(1), 117–129. <https://doi.org/10.1007/s11097-016-9497-4>

Hou, Y., Huang, Q., Prakash, R., & Chaudhury, S. (2013). Infrequent near death experiences in severe brain injury survivors - A quantitative and qualitative study. *Annals of Indian Academy of Neurology*, *16*(1), 75–81. <https://doi.org/10.4103/0972-2327.107715>

Hufford, D. (1982). *The terror that comes in the night: An experience-centered study of supernatural assault traditions (Vol. 7)*. University of Pennsylvania Press, PA.

IANDS. (2021). *Key Facts about Near-Death Experience - History and Prevalence*.

International Association for Near-Death Studies. <https://iands.org/ndes/about-ndes/key-nde-facts21.html?start=1>

Initiative, S. C. R. (2021). Shared death experiences: A little-known type of end-of-life phenomena reported by caregivers and loved ones. *American Journal of Hospice and*

Palliative Medicine, 12(8), 1479–1487.

J. Hill, S. (2019). *Confrontation with the Unconscious: Jungian Depth Psychology and Psychedelic Experience*. Aeon Books.

Jans-Beken, L., Jacobs, N., Janssens, M., Peeters, S., Reijnders, J., Lechner, L., & Lataster, J. (2020). Gratitude and health: An updated review. *The Journal of Positive Psychology*, 15(6), 743–782.

Jansen, K. (1989). Near death experience and the NMDA receptor. *BMJ (Clinical Research Ed.)*, 298(6689), 1708. <https://doi.org/10.1136/bmj.298.6689.1708-b>

Jansen, K. L. R. (1997). Response to Commentaries on “The Ketamine Model of the Near-Death Experience . . .” *Journal of Near-Death Studies*, 16(1). <https://doi.org/10.1023/A>

Jansen, Karl. (2000). *Ketamine: Dreams and Realities Ketamine*. Multidisciplinary Association for Psychedelic Studies, Sarasota, FL.

Jansen, K. L. R. (2004). What can ketamine teach us about ordinary and altered states of consciousness? *Toward a Science of Consciousness Conference, Tucson, Arizona, 90*.

John, G. S. (2018). Gnosis potency: DMT breakthroughs and paragnosis. *Plant Medicines, Healing and Psychedelic Science: Cultural Perspectives*, 205–222. https://doi.org/10.1007/978-3-319-76720-8_12

Johnson, M. W., Richards, W. A., & Hopkins, J. (2008). Human hallucinogen research: guidelines for safety. *Journal of Psychopharmacology*, 22(6), 603–620. <https://doi.org/10.1177/0269881108093587>

Judson, I., & Wiltshaw, E. (1983). A Near-death Experience. *The Lancet*, 561–562.

Jung, C. G. (1969). *The Archetypes and the Collective Unconscious*. Princeton University Press.

Jung, C. G. (1989). *Memories, dreams, reflections*. Vintage.

Kaelen, M., Roseman, L., Kahan, J., Santos-Ribeiro, A., Orban, C., Lorenz, R., Barrett, F. S., Bolstridge, M., Williams, T., Williams, L., Wall, M. B., Feilding, A., Muthukumaraswamy, S., Nutt, D. J., & Carhart-Harris, R. (2016). LSD modulates music-induced imagery via

- changes in parahippocampal connectivity. *European Neuropsychopharmacology*, 26(7), 1099–1109. <https://doi.org/10.1016/J.EURONEURO.2016.03.018>
- Kangaslampi, S. (2022). The role of mystical experiences in improved wellbeing after psychedelic use - a comprehensive review of the evidence. *Interdisciplinary Conference on Psychedelic Research, Sep 22nd-24th*.
- Kastrup, B. (2022). Psychedelic effects are one piece of a much bigger puzzle. *Interdisciplinary Conference on Psychedelic Research, Sep 22nd-24th*.
- Keel, J. A. (1970). *UFO's: Operation Trojan Horse*. Putnam.
- Kellehear, A. (1993). Culture, biology, and the near-death experience: A reappraisal. *Journal of Nervous and Mental Disease*, 181(3), 148–156.
- Kellehear, A, Stevenson, I., Pasricha, S., & Cook, E. (1994). The absence of tunnel sensations in near-death experiences from India. *J Near Death Stud.*, 13, 109–113.
- Kellehear, Allan, & Ph, D. (2008). Census of non-Western near-death experiences to 2005: Overview of the current data. *Journal of Near-Death Studies*, 26(4), 249–265. <https://doi.org/10.17514/jnds-2008-26-4-p249-265>.
- Kellenberger, J. (1978). Mysticism and drugs. *Religious Studies*, 14(2), 175–191.
- Kelly, E. F. (2015). Toward a worldview grounded in science and spirituality. In E. F. Kelly, A. Crabtree, & P. Marshall (Eds.), *Beyond Physicalism* (pp. 493–553). Lanham: Rowman & Littlefield.
- Kelly, E. W. (2001). Near-death experiences with reports of meeting deceased people. *Death Stud.*, 25, 229–249.
- Kerr, N. H., & Domhoff, G. W. (2004). Do the blind literally “see” in their dreams? A critique of a recent claim that they do. *Dreaming*, 14(4), 230–233. <https://doi.org/10.1037/1053-0797.14.4.230>
- Kettner, H, Rosas, F. E., Timmermann, C., & Kärtner, L. (2021). Psychedelic Communitas : Intersubjective Experience During Psychedelic Group Sessions Predicts Enduring Changes in Psychological Wellbeing and Social Connectedness. *Frontiers in Pharmacology*, 12(March), 1–20. <https://doi.org/10.3389/fphar.2021.623985>

- Kettner, Hannes, Gandy, S., Haijen, E. C. H. M., & Carhart-Harris, R. L. (2019). From egoism to ecoism: Psychedelics increase nature relatedness in a state-mediated and context-dependent manner. *International Journal of Environmental Research and Public Health*, *16*(24). <https://doi.org/10.3390/ijerph16245147>
- Khan, S. M., Carter, G. T., Aggarwal, S. K., & Holland, J. (2021). Psychedelics for Brain Injury: A Mini-Review. *Frontiers in Neurology*, *12*, 1260. <https://doi.org/10.3389/FNEUR.2021.685085/BIBTEX>
- Khanna, S., & Greyson, B. (2013). Near-Death Experiences and Spiritual Well-Being. *Journal of Religion and Health* *2013* *53*:6, *53*(6), 1605–1615. <https://doi.org/10.1007/S10943-013-9723-0>
- Khanna, S., Moore, L. E., & Greyson, B. (2018). Full Neurological Recovery from *Escherichia coli* Meningitis Associated with Near-Death Experience. *Journal of Nervous and Mental Disease*, *206*(9), 744–747. <https://doi.org/10.1097/NMD.0000000000000874>
- King, L. N., Roe, C. A., & Spencer, M. (2019). An IPA Study of Anomalous Experiences in Temporal Lobe Epilepsy. *62nd Annual Convention of the Parapsychology Association, 4th-6th July*.
- Kjellgren, A., Eriksson, A., & Norlander, T. (2009). Experiences of encounters with ayahuasca—“the vine of the soul.” *Journal of Psychoactive Drugs*, *41*(4), 309–315. <https://doi.org/10.1080/02791072.2009.10399767>
- Klemenc-Ketis, Z., Kersnik, J., & Grmec, S. (2010). The effect of carbon dioxide on near-death experiences in out-of-hospital cardiac arrest survivors: A prospective observational study. *Critical Care*, *14*(2). <https://doi.org/10.1186/cc8952>
- Koch, C. (2013). Ubiquitous Minds. *Scientific American Mind*, *25*(1), 26–29. <https://doi.org/10.1038/SCIENTIFICAMERICANMIND0114-26>
- Koch, C. (2019). *The feeling of life itself: why consciousness is widespread but can't be computed*. Mit Press.
- Koch, C. (2022, May 19). *TSC 2022 - Plenary 2 - Keynote 1 - Brain & Consciousness*. YouTube. <https://www.youtube.com/watch?v=z-mTmeff4VU>

- Kometer, M., Pokorny, T., Seifritz, E., & Volleinweider, F. X. (2015). Psilocybin-induced spiritual experiences and insightfulness are associated with synchronization of neuronal oscillations. *Psychopharmacology*, *232*(19), 3663–3676.
<https://doi.org/10.1007/S00213-015-4026-7/FIGURES/4>
- Kondziella, D., Dreier, J. P., & Olsen, M. H. (2019). Prevalence of near-death experiences in people with and without REM sleep intrusion. *PeerJ*, *7*(e7585).
- Kondziella, Daniel, Olsen, M. H., Lemale, C. L., & Dreier, J. P. (2019). Migraine aura, a predictor of near-death experiences in a crowdsourced study. *PeerJ*, *2019*(12), e8202.
<https://doi.org/10.7717/PEERJ.8202/SUPP-2>
- Kondziella, Daniel. (2020). The Neurology of Death and the Dying Brain: A Pictorial Essay. *Frontiers in Neurology*, *11*(July), 1–16. <https://doi.org/10.3389/fneur.2020.00736>
- Koster-Hale, J., & Saxe, R. (2013). Theory of Mind: A Neural Prediction Problem. In *Neuron* (Vol. 79, Issue 5, pp. 836–848). Cell Press.
<https://doi.org/10.1016/j.neuron.2013.08.020>
- Kozłowska, U., Nichols, C., Wiatr, K., & Figiel, M. (2022). From psychiatry to neurology: Psychedelics as prospective therapeutics for neurodegenerative disorders. *Journal of Neurochemistry*, *162*(1), 89–108. <https://doi.org/10.1111/JNC.15509>
- Krill, A. E., Alpert, H. J., & Ostfeld, A. M. (1963). Hallucinogenic Agent in Blind Subjects. *JAMA: The Journal of the American Medical Association*, *183*(8), 200–201.
<https://doi.org/10.1001/jama.1963.03700080134056>
- Kripal, J. (2022). Biological Gods: Science (Fiction) and Some Emergent Mythologies. In David Luke & R. Spowers (Eds.), *DMT entity encounters: dialogues on the spirit molecule*. Park Street Press.
- Kroeger, D., Florea, B., & Amzica, F. (2013). Human Brain Activity Patterns beyond the Isoelectric Line of Extreme Deep Coma. *PLoS ONE*, *8*(9), 1–13.
<https://doi.org/10.1371/journal.pone.0075257>
- Krohn, E., & Kripal, J. (2018). *Changed in a Flash: One Woman's Near-Death Experience and Why a Scholar Thinks It Empowers Us All*. North Atlantic Books.

- Kuypers, K. P. C., Riba, J., de la Fuente Revenga, M., Barker, S., Theunissen, E. L., & Ramaekers, J. G. (2016). Ayahuasca enhances creative divergent thinking while decreasing conventional convergent thinking. *Psychopharmacology*, *233*(18), 3395–3403. <https://doi.org/10.1007/s00213-016-4377-8>
- Lake, J. (2017). The near-death experience : implications for neuroscience and non-local consciousness. *Journal of Nonlocality*, *5*(1), 1–25.
- Lake, J. (2019). The near-death experience (NDE) as an inherited predisposition: Possible genetic, epigenetic, neural and symbolic mechanisms. *Medical Hypotheses*, *126*(January), 135–148. <https://doi.org/10.1016/j.mehy.2019.03.016>
- Lancelotta, R. L., & Davis, A. K. (2020). Use of Benefit Enhancement Strategies among 5-Methoxy-N,N-Dimethyltryptamine (5-MeO-DMT) Users: Associations with Mystical, Challenging, and Enduring Effects. *Journal of Psychoactive Drugs*, *52*(3), 273–281. <https://doi.org/10.1080/02791072.2020.1737763>
- Lange, R., Greyson, B., & Houran, J. (2004). A Rasch scaling validation of a ‘core’ near-death experience. *British Journal of Psychology*, *95*(2), 161–177.
- Lange, Rense, Greyson, B., & Houran, J. (2015). Using computational linguistics to understand near-death experiences: Concurrent validity for the Near Death Experience Scale. *Psychology of Consciousness: Theory, Research, and Practice*, *2*(1), 79–89. <https://doi.org/10.1037/cns0000040>
- Larkin, M., Eatough, V., & Osborn, M. (2011). Interpretative phenomenological analysis and embodied, active, situated cognition. *Theory & Psychology*, *21*(3), 318–337.
- Laughlin, C. D. (2000). Biogenetic Structural Theory and the Neurophenomenology of Consciousness. *Toward a Science of Consciousness III: The Third Tucson Discussions and Debates*, *3*, 459.
- Laughlin, C. D., & D’Aquili, E. G. (1974). *Biogenetic structuralism*. Columbia University Press, NY.
- Leary, T. (1966). Programmed communication during experiences with DMT. *The Psychedelic Review*, *8*, 83–95.

- Leary, T., Alpert, R., & Metzner, R. (1964). *The psychedelic experience: A manual based on the Tibetan book of the dead*. Citadel.
- Lebedev, A. V., Kaelen, M., Lövdén, M., Nilsson, J., Feilding, A., Nutt, D. J., & Carhart-Harris, R. L. (2016). LSD-induced entropic brain activity predicts subsequent personality change. *Human Brain Mapping, 37*(9), 3203–3213.
<https://doi.org/10.1002/HBM.23234>
- Lebedev, Alexander V., Lövdén, M., Rosenthal, G., Feilding, A., Nutt, D. J., & Carhart-Harris, R. L. (2015). Finding the self by losing the self: Neural correlates of ego-dissolution under psilocybin. *Human Brain Mapping, 36*(8), 3137–3153.
<https://doi.org/10.1002/HBM.22833>
- Lee, D. E., Lee, L. G., Siu, D., Bazrafkan, A. K., Farahabadi, M. H., Dinh, T. J., Orellana, J., Xiong, W., Lopour, B. A., & Akbari, Y. (2017). Neural Correlates of Consciousness at Near-Electrocerebral Silence in an Asphyxial Cardiac Arrest Model. *Brain Connectivity, 7*(3), 172–181. <https://doi.org/10.1089/brain.2016.0471>
- Lévi-Strauss, C. (1963). *Structural Anthropology (Anthropologie Structurale, 1958)* (C. Jacobson & G. S. Brooke (Eds.)). Anchor Books, NY.
- Li, D., Mabrouk, O. S., Liu, T., Tian, F., Xu, G., Rengifo, S., Choi, S. J., Mathur, A., Crooks, C. P., Kennedy, R. T., Wang, M. M., Ghanbari, H., & Borjigin, J. (2015). Asphyxia-activated corticocardiac signaling accelerates onset of cardiac arrest. *Proceedings of the National Academy of Sciences of the United States of America, 112*(16), E2073–E2082.
<https://doi.org/10.1073/pnas.1423936112>
- Liechti, M., & Ley, L. (2020). *Effects of Dimethyltryptamine in Healthy Subjects (NCT04353024)*. ClinicalTrials.Gov.
<https://clinicaltrials.gov/ct2/show/NCT04353024?term=liechti+dmtd&draw=2&rank=1>
- Lieberman, M. B. (2013). Near-death experiences and ayahuasca-induced experiences - Two unique pathways to a phenomenologically similar state of consciousness. *Journal of Transpersonal Psychology, 45*(1), 24–48.
- Lilly, J. (1972). *The Center of the Cyclone: An Autobiography of Inner Space*. Julian Press.

- Loizaga-Velder, A., & Verres, R. (2014). Therapeutic Effects of Ritual Ayahuasca Use in the Treatment of Substance Dependence—Qualitative Results. *Journal of Psychoactive Drugs*, 46(1), 63–72. <https://doi.org/10.1080/02791072.2013.873157>
- Long, J. P., & Long, J. A. (2003). A comparison of near-death experiences occurring before and after 1975: Results From an internet survey. *Journal of Near-Death Studies*, 22(1), 21–32. <https://doi.org/10.17514/jnds-2003-22-1-p21-32>.
- Long, J., & Perry, P. (2016). *God and the Afterlife: The Groundbreaking New Evidence for God and Near-Death Experience*. Harper Collins.
- Lorimer, D. (1990). *Whole in one: The near-death experience and the ethic of interconnectedness*. Arkana.
- Luke, D. P., & Kittenis, M. (2005). A preliminary survey of paranormal experiences with psychoactive drugs. *The Journal of Parapsychology*, 69(2), 305.
- Luke, David. (2008). *Disembodied Eyes Revisited : An Investigation into the Ontology of Entheogenic Entity Encounters*. XVII(1), 1–9.
- Luke, D. (2009). 'Near-death experiences: Exploring the mind-body connection, by Ornella Corazza' [book review]. *Journal of Parapsychology*, 73, 175–180.
- Luke, D., & Friedman, H. L. (2010). The neurochemistry of psi reports and associated experiences. In S. Krippner & H. L. Friedman (Eds.), *Mysterious minds: The neurobiology of psychics, mediums, and other extraordinary people* (pp. 163–185). Praeger/ABC-CLIO.
- Luke, David. (2011). Discarnate entities and dimethyltryptamine (DMT): Psychopharmacology , phenomenology and ontology. *The Journal of the American Society for Psychical Research*, 75(902).
- Luke, David. (2012). Psychoactive Substances and Paranormal Phenomena: A Comprehensive Review. *Article in International Journal of Transpersonal Studies*, 1(31). <https://doi.org/10.24972/ijts.2012.31.1.97>
- Luke, David. (2013a). Ecopsychology and the psychedelic experience. *European Journal of Ecopsychology*, 4(1), 1–8.

- Luke, David. (2013b). So long as you've got your elf: Death, DMT and discarnate entities. In A. Voss & W. Rowlandson (Eds.), *Daimonic imagination: Uncanny intelligence* (pp. 282-291). Cambridge Scholars Publishing.
- Luke, David. (2017). *Otherworlds: Psychedelics and exceptional human experience*. Muswell Hill Press.
- Luke, David. (2018). Reply to "Ayahuasca turned on my mind's eye": A case of acquired versus congenital aphantasia, as evidenced with DMT use? *Journal of Psychedelic Studies*, 2(2), 97–98. <https://doi.org/10.1556/2054.2018.014>
- Luke, David, & Spowers, R. (2018). *DMT Dialogues: Encounters with the Spirit Molecule* (David Luke & R. Spowers (Eds.)). Park Street Press.
- Luke, David. (2019). Psi and the Spirit Molecule "DMT." *43rd International SPR Annual Conference: Holiday Inn, Leicester 20th – 22nd September*.
- Luke, David. (2020). Anomalous Psychedelic Experiences: At the Neurochemical Juncture of the Humanistic and Parapsychological. *Journal of Humanistic Psychology*, 62(2), 257–297. <https://doi.org/10.1177/0022167820917767>
- Luke, D., & Spowers, R. (2022). *DMT entity encounters: dialogues on the spirit molecule*. Park Street Press.
- Luke, David P., Lungu, L., Friday, R., & Terhune, D. B. (2022). The chemical induction of synaesthesia. *Human Psychopharmacology: Clinical and Experimental*, e2832.
- Luna, L. E. (2022). On Encounters with Entities in the Ayahuasca Realm. A Phenomenological View. In David Luke & R. Spowers (Eds.), *DMT entity encounters: dialogues on the spirit molecule*. Park Street Press.
- Luo, L., & Lv, J. (2020). Quantum protein folding. *Advances in Quantum Chemistry*, 82, 181–211. <https://doi.org/10.1016/BS.AIQ.2020.01.001>
- Lutkajtis, A. (2020). Entity encounters and the therapeutic effect of the psychedelic mystical experience. *Journal of Psychedelic Studies*, 4(3), 171–178. <https://doi.org/10.1556/2054.2020.00143>
- Lyke, J. (2019, June). *DMT and Entities: Not Everyone Gets Machine Elves | Jennifer A. Lyke -*

YouTube. <https://www.youtube.com/watch?v=bWTT4778IIQ>

Mack, J. E. (1994). *Abduction: Human encounters with aliens*. Scribner's.

Mack, J. E. (2000). *Passport to the cosmos: Human transformation and alien encounters*. Three Rivers Press.

Mack, J. E. (2011). *The Alien Abduction Experience - Budd Hopkins and John Mack, MD*. UFOTV On Demand; YouTube. <https://www.youtube.com/watch?v=L9SJUowifik>

MacLean, K. A., Johnson, M. W., & Griffiths, R. R. (2011). Domain of Openness Mystical Experiences Occasioned by the Hallucinogen Psilocybin Lead to Increases in the Personality On behalf of: British Association for Psychopharmacology can be found at: Journal of Psychopharmacology Additional services and information for. *J Psychopharmacol*, *0*(0), 1–9. <https://doi.org/10.1177/02698811111420188>

MacLean, K. A., Leoutsakos, J. M. S., Johnson, M. W., & Griffiths, R. R. (2012). Factor Analysis of the Mystical Experience Questionnaire: A Study of Experiences Occasioned by the Hallucinogen Psilocybin. *Journal for the Scientific Study of Religion*, *51*(4), 721–737. <https://doi.org/10.1111/j.1468-5906.2012.01685.x>

Marshall, P. (2005). *Mystical encounters with the natural world: Experiences and explanations*. Oxford University Press.

Martial, C., Cassol, H., Antonopoulos, G., Charlier, T., Heros, J., Donneau, A. F., Charland-Verville, V., & Laureys, S. (2017). Temporality of features in near-death experience narratives. *Frontiers in Human Neuroscience*, *11*(June), 1–9. <https://doi.org/10.3389/fnhum.2017.00311>

Martial, C., Cassol, H., Charland-Verville, V., Merckelbach, H., & Laureys, S. (2018). Fantasy proneness correlates with the intensity of near-death experience. *Frontiers in Psychiatry*, *9*(JUN), 1–7. <https://doi.org/10.3389/fpsy.2018.00190>

Martial, C., Cassol, H., Charland-Verville, V., Pallavicini, C., Sanz, C., Zamberlan, F., Vivot, R. M., Erowid, F., Erowid, E., Laureys, S., Greyson, B., & Tagliazucchi, E. (2019a). Neurochemical models of near-death experiences: A large-scale study based on the semantic similarity of written reports. *Consciousness and Cognition*, *69*(December

2018), 52–69. <https://doi.org/10.1016/j.concog.2019.01.011>

Martial, C., Cassol, H., Charland-Verville, V., Pallavicini, C., Sanz, C., Zamberlan, F., Vivot, R. M., Erowid, F., Erowid, E., Laureys, S., Greyson, B., & Tagliazucchi, E. (2019b).

Neurochemical models of near-death experiences: A large-scale study based on the semantic similarity of written reports. *Consciousness and Cognition*, *69*, 52–69.

<https://doi.org/10.1016/j.concog.2019.01.011>

Martial, C., Mensen, A., Charland-Verville, V., Vanhaudenhuyse, A., Rentmeister, D., Bahri, M. A., Cassol, H., Englebert, J., Gosseries, O., Laureys, S., & Faymonville, M. E. (2019).

Neurophenomenology of near-death experience memory in hypnotic recall: a within-subject EEG study. *Scientific Reports*, *9*(1), 1–11. <https://doi.org/10.1038/s41598-019-50601-6>

Martial, C., Cassol, H., Laureys, S., & Gosseries, O. (2020). Near-Death Experience as a Probe to Explore (Disconnected) Consciousness. *Trends in Cognitive Sciences*, *24*(3), 173–183.

<https://doi.org/10.1016/j.tics.2019.12.010>

Martial, C., Simon, J., Puttaert, N., Gosseries, O., Charland-Verville, V., Nyssen, A. S., Greyson, B., Laureys, S., & Cassol, H. (2020). The Near-Death Experience Content (NDE-C) scale: Development and psychometric validation. *Consciousness and Cognition*, *86*.

<https://doi.org/10.1016/j.concog.2020.103049>

Mays, R. G. (2015). *AWARE study initial results are published -- Commentary*.

McKenna, D. (2018). Is DMT a chemical messenger from an extra-terrestrial civilisation? In David Luke & R. Spowers (Eds.), *DMT Dialogues: Encounters with the Spirit Molecule*. Park Street Press.

McKenna, T. (1993, February 27). *Alien Dreamtime - Space Time Continuum with Terence McKenna*. YouTube. https://www.youtube.com/watch?v=_8O6sVbMhdY

Meyer, P. (1992). *Apparent Communication with Discarnate Entities Induced by Dimethyltryptamine (DMT)* (Thomas Lyttle (Ed.)). *Psychedelic Monographs and Essays*, Volume 6. <https://www.serendipity.li/dmt/dmtart06.html>

Michael, P. (2021a). Commentary on “After: A Doctor Explores What Near-Death

- Experiences Reveal About Life and Beyond” by Bruce Greyson. *Journal of Near-Death Studies*, 39(3). <https://doi.org/https://doi.org/10.17514/JNDS-2021-39-3-p161-183>.
- Michael, P. (2021b). Rejoinder to “Response to Pascal Michael’s commentary on After: A Doctor Explores What Near-Death Experiences Reveal About Life and Beyond”. *Journal of Near-Death Studies*, 39(3). <https://doi.org/https://doi.org/10.17514/JNDS-2021-39-3-p161-183>.
- Michael, P. (2022a). Thanatotherapy: How Psychedelic-assisted Psychotherapy and the Near-death Experience can Mutually Benefit One Another. *Psychotherapy Section Review, British Psychological Association*, 67, 99–108.
- Michael, P. (2022b). The Death-Trip: A Case Study of Psilocybin’s Simulation of the Phenomenology and Long-term changes of the Near-death Experience. In Tollen, A., Wyrd, N., Wells, H. et al (Ed.). In *Breaking Convention: A Seismic Shift in Psychedelia*. Strange Attractor Press.
- Miller, M. J., Albarracin-Jordan, J., Moore, C., & Capriles, J. M. (2019). Chemical evidence for the use of multiple psychotropic plants in a 1,000-year-old ritual bundle from South America. *Proceedings of the National Academy of Sciences of the United States of America*, 166(23), 11207–11212. <https://doi.org/10.1073/pnas.1902174116>
- Millière, R., Carhart-Harris, R. L., Roseman, L., Trautwein, F. M., & Berkovich-Ohana, A. (2018). Psychedelics, meditation, and self-consciousness. *Frontiers in Psychology*, 9(SEP). <https://doi.org/10.3389/fpsyg.2018.01475>
- Mobbs, D., & Watt, C. (2011). There is nothing paranormal about near-death experiences: How neuroscience can explain seeing bright lights, meeting the dead, or being convinced you are one of them. *Trends in Cognitive Sciences*, 15(10), 447–449. <https://doi.org/10.1016/j.tics.2011.07.010>
- Montemayor, J. (2018). Death is Only the Beginning. *Theartconference*.
- Montenegro, R. (2015). The out-of-body experience - An experiential anthology. *Journal of Exceptional Experiences and Psychology*, 62.
- Moody, R. (1975). *Life after life*. Mockingbird books.

- Moody, Raymond. (1989). *The light beyond*. Bantam.
- Moody, R. A., & Perry, P. (2010). *Glimpse of Eternity*. Guideposts.
- Moody, R. (2011). *Glimpses of eternity: An investigation into shared death experiences*. Random House.
- Moody, Raymond. (2012). *Paranormal: My life in pursuit of the afterlife*. HarperOne.
- Moorjani, A. (2012). *Dying to be me: My journey from cancer, to near death, to true healing*. Hay House.
- Morales-Garcia, J. A., Calleja-Conde, J., Lopez-Moreno, J. A., Alonso-Gil, S., Sanz-SanCristobal, M., Riba, J., & Perez-Castillo, A. (2020). N,N-dimethyltryptamine compound found in the hallucinogenic tea ayahuasca, regulates adult neurogenesis in vitro and in vivo. *Translational Psychiatry*, *10*(1). <https://doi.org/10.1038/s41398-020-01011-0>
- Moreton, S. G., Szalla, L., Menzies, R. E., & Arena, A. F. (2020). Embedding existential psychology within psychedelic science: reduced death anxiety as a mediator of the therapeutic effects of psychedelics. *Psychopharmacology*, *237*(1), 21–32. <https://doi.org/10.1007/s00213-019-05391-0>
- Morse, M., Castillo, P., Venecia, D., Milstein, J., & Tyler, D. C. (1986). Childhood near-death experiences. *American Journal of Diseases of Children*, *1110–1114*(140), 11.
- Morse, M. L., Venecia, D., & Milstein, J. (1989). Near-death experiences: A neurophysiologic explanatory model. *Journal of Near-Death Studies*, *8*(1), 45–53. <https://doi.org/10.1007/BF01076138>
- Morse, M. (1996). Parting visions: a new scientific paradigm. In L. Bailey & J. Yates (Eds.), *The near-death experience: a reader* (pp. 299–318). Routledge.
- Mota-Rolim, S., Erlacher, D., Tort, A., Araujo, J., & Ribeiro, S. (2012). Different kinds of subjective experience during lucid dreaming may have different neural sub_strates
Commentary on “The neurobiology of consciousness: Lucid dreaming wakes up” by J. Allan Hobson. *IJDR*, *3*(1), 33–35.
- Moulin, C. (2017). The cognitive neuropsychology of déjà vu. *The Cognitive Neuropsychology*

of *Deja Vu*, 1–200. <https://doi.org/10.4324/9781315524931/COGNITIVE-NEUROPSYCHOLOGY-D>

Mruck, K., & Breuer, F. (2003). Subjectivity and reflexivity in qualitative research—A new FQS issue. *Historical Social Research/Historische Sozialforschung*, 189–212.

Muraresku, B. C. (2020). *The Immortality Key: The Secret History of the Religion with No Name*. St Martin's Publishing Group.

Murphy-Beiner, A., & Soar, K. (2020). Ayahuasca's 'afterglow': improved mindfulness and cognitive flexibility in ayahuasca drinkers. *Psychopharmacology*, 237(4), 1161–1169. <https://doi.org/10.1007/s00213-019-05445-3>

Muthukumaraswamy, S. D., Carhart-Harris, R. L., Moran, R. J., Brookes, M. J., Williams, T. M., Errtizoe, D., Sessa, B., Papadopoulos, A., Bolstridge, M., Singh, K. D., Feilding, A., Friston, K. J., & Nutt, D. J. (2013). Broadband cortical desynchronization underlies the human psychedelic state. *Journal of Neuroscience*, 33(38), 15171–15183. <https://doi.org/10.1523/JNEUROSCI.2063-13.2013>

Muzio, J. N., Roffwarg, H. P., & Kaufman, E. (1966). Alterations in the nocturnal sleep cycle resulting from LSD. *Electroencephalography and Clinical Neurophysiology*, 21(4), 313–324. [https://doi.org/10.1016/0013-4694\(66\)90037-X](https://doi.org/10.1016/0013-4694(66)90037-X)

Narby, J. (2018). Amazonian Perspectives on Invisible Entities. In David Luke & R. Spowers (Eds.), *DMT Dialogues: Encounters with the Spirit Molecule*. Park Street Press.

Narby, Jeremy. (1998). *The Cosmic Serpent*. Georg.

Nayak, S. M., Singh, M., Yaden, D. B., & Griffiths, R. R. (2022). Belief changes associated with psychedelic use. *Journal of Psychopharmacology*, 0(0). <https://doi.org/doi:10.1177/02698811221131989>

Nayak, Sandeep M., & Griffiths, R. R. (2022). A Single Belief-Changing Psychedelic Experience Is Associated With Increased Attribution of Consciousness to Living and Non-living Entities. *Frontiers in Psychology*, 0, 1035. <https://doi.org/10.3389/FPSYG.2022.852248>

Nelson, K. R., Mattingly, M., Lee, S. A., & Schmitt, F. A. (2006). Does the arousal system contribute to near death experience? *Neurology*, 66(7), 1003–1009.

<https://doi.org/10.1212/01.wnl.0000204296.15607.37>

Nichols, D. E. (2017). *David Nichols - DMT And The Pineal Gland: Facts vs Fantasy*. YouTube.
<https://www.youtube.com/watch?v=YeeqHUiC8Io>

Nichols, D. E. (2018). N,N-dimethyltryptamine and the pineal gland: Separating fact from myth. *Journal of Psychopharmacology*, *32*(1), 30–36.
<https://doi.org/10.1177/0269881117736919>

Nicol, A. U., & Morton, A. J. (2020). Characteristic patterns of EEG oscillations in sheep (*Ovis aries*) induced by ketamine may explain the psychotropic effects seen in humans. *Scientific Reports*, *10*(1), 1–10. <https://doi.org/10.1038/s41598-020-66023-8>

Norton, L., Gibson, R. M., Gofton, T., Benson, C., Dhanani, S., Shemie, S. D., Hornby, L., Ward, R., & Bryan Young, G. (2017). Electroencephalographic Recordings during Withdrawal of Life-Sustaining Therapy until 30 Minutes after Declaration of Death. *Canadian Journal of Neurological Sciences*, *44*(2), 139–145.
<https://doi.org/10.1017/cjn.2016.309>

Noyes, R., & Slymen, D. J. (1979). The subjective response to life-threatening danger. *Omega*, *9*.

Ohkado, M., & Greyson, B. (2018). A Comparison of Hypnotically-Induced Death Experiences and Near-Death Experiences. *Journal of International Society of Life Information Science*, *36*(2), 73. https://doi.org/10.18936/islis.36.2_73

Okruszek, L., Bala, A., Wordecha, M., Jarkiewicz, M., Wysokiński, A., Szczepocka, E., Piejka, A., Zaborowska, O., Szantroch, M., Rysz, A., & Marchel, A. (2017). Social cognition in neuropsychiatric populations: A comparison of theory of mind in schizophrenia and mesial temporal lobe epilepsy. *Scientific Reports*, *7*(1), 1–9.
<https://doi.org/10.1038/s41598-017-00565-2>

Oldroyd, K. G., Harvey, K., Gray, C. E., Beastall, G. H., & Cobbe, S. M. (1992). β Endorphin release in patients after spontaneous and provoked acute myocardial ischaemia. *British Heart Journal*, *67*(3), 230–235. <https://doi.org/10.1136/HRT.69.1.93>

Osis, K., & Haraldsson, E. (1986). *At the Hour of Death*. Hastings House, Mamarocek, NY.

- Ott, J. (1996). Entheogens II: on entheology and entheobotany. *J Psychoactive Drugs*, 28(2), 205–209.
- Ott, U., Reuter, M., Hennig, J., & Vaitl, D. (2005). Evidence for a common biological basis of the absorption trait, hallucinogen effects, and positive symptoms: epistasis between 5-HT2a and COMT polymorphisms. *Am. J. Med. Genet. B Neuropsychiatr. Genet.*, 137B, 29–32.
- Overgaard, M., & Overgaard, R. (2010). Neural correlates of contents and levels of consciousness. *Frontiers in Psychology*, 0(OCT), 164.
<https://doi.org/10.3389/FPSYG.2010.00164/BIBTEX>
- Owens, J. E., Cook, E. W., & Stevenson, I. (1990). Features of “near-death experience” in relation to whether or not patients were near death. *Lancet*, 336, 1175–1177.
[https://doi.org/10.1016/0140-6736\(90\)92780-L](https://doi.org/10.1016/0140-6736(90)92780-L)
- Palaganas, E. C., Sanchez, M. C., Molintas, V. P., & Caricativo, R. D. (2017). Reflexivity in qualitative research: A journey of learning. *Qualitative Report*, 22(2).
- Palamar, J. J., & Le, A. (2018). Trends in DMT and other tryptamine use among young adults in the United States. *The American Journal on Addictions*, 27(7), 578–585.
<https://doi.org/10.1111/ajad.12803>
- Palhano-Fontes, F., Andrade, K. C., Tofoli, L. F., Jose, A. C. S., Crippa, A. S., Hallak, J. E. C., Ribeiro, S., & De Araujo, D. B. (2015). The Psychedelic State Induced by Ayahuasca Modulates the Activity and Connectivity of the Default Mode Network. *PLOS ONE*, 10(2), e0118143. <https://doi.org/10.1371/JOURNAL.PONE.0118143>
- Palhano-Fontes, F., Barreto, D., Onias, H., Andrade, K. C., Novaes, M. M., Pessoa, J. A., Mota-Rolim, S. A., Osório, F. L., Sanches, R., Dos Santos, R. G., Tófoli, L. F., De Oliveira Silveira, G., Yonamine, M., Riba, J., Santos, F. R., Silva-Junior, A. A., Alchieri, J. C., Galvão-Coelho, N. L., Lobão-Soares, B., ... Araújo, D. B. (2019). Rapid antidepressant effects of the psychedelic ayahuasca in treatment-resistant depression: A randomized placebo-controlled trial. *Psychological Medicine*, 49(4), 655–663.
<https://doi.org/10.1017/S0033291718001356>
- Pallavicini, C., Cavanna, F., Zamberlan, F., de la Fuente, L. A., Perl, Y. S., Arias, M., Romero,

- C., Carhart-Harris, R., Timmermann, C., & Tagliazucchi, E. (2020). Neural and subjective effects of inhaled DMT in natural settings. *BioRxiv*, 1–39.
<https://doi.org/10.1101/2020.08.19.258145>
- Palmieri, A., Calvo, V., Kleinbub, J. R., Meconi, F., Marangoni, M., Barilaro, P., Broggio, A., Sambin, M., & Sessa, P. (2014). “Reality” of near-death-experience memories: Evidence from a psychodynamic and electrophysiological integrated study. *Frontiers in Human Neuroscience*, 8(JUNE), 1–16. <https://doi.org/10.3389/fnhum.2014.00429>
- Parnia, S., Spearpoint, K., de Vos, G., Fenwick, P., Goldberg, D., Yang, J., Zhu, J., Baker, K., Killingback, H., McLean, P., Wood, M., Zafari, A. M., Dickert, N., Beisteiner, R., Sterz, F., Berger, M., Warlow, C., Bullock, S., Lovett, S., ... Schoenfeld, E. R. (2014). AWARE-Awareness during REsuscitation-A prospective study. *Resuscitation*, 85(12), 1799–1805. <https://doi.org/10.1016/j.resuscitation.2014.09.004>
- Parnia, S., Waller, D. G., Yeates, R., & Fenwick, P. (2001). A qualitative and quantitative study of the incidence, features and aetiology of near death experiences in cardiac arrest survivors. *Resuscitation*, 48(2), 149–156. [https://doi.org/10.1016/S0300-9572\(00\)00328-2](https://doi.org/10.1016/S0300-9572(00)00328-2)
- Pasricha, S., & Stevenson, I. (1986). Near-death experiences in India: A preliminary report. *The Journal of Nervous and Mental Disease*, 174(3), 165–170.
- Pederzoli, L., De Stefano, E., & Tressoldi, P. (2019). Hypno-death-experiences: Death experiences during hypnotic life regressions. *Death Studies*, 0(0), 1–5.
<https://doi.org/10.1080/07481187.2019.1626949>
- Peinkhofer, C., Dreier, J. P., & Kondziella, D. (2019). Semiology and Mechanisms of Near-Death Experiences. *Current Neurology and Neuroscience Reports*, 19(9).
<https://doi.org/10.1007/s11910-019-0983-2>
- Peinkhofer, C., Martial, C., Cassol, H., Kondziella, D., Hospital, F., Group, C. S., & Kondziella, D. (2021). *The evolutionary origin of near-death experiences : a systematic*. 4939(abstract 175), 1–29.
- Pennachio, J. (1986). Near-death experience as mystical experience. *Journal of Religion and Health*, 25, 64–72.

- Petitmengin, C. (2006). Describing one's subjective experience in the second person: An interview method for the science of consciousness. *Phenomenol. Cogn. Sci.*, 5, 229–269.
- Petitmengin, Claire. (2017, December 13). Exploring the hidden side of lived experience through Micro-phenomenology. *XTalks: Digital Discourses, Dec 2017, Massachusetts Institute Of Technology, Boston, United States*. <https://hal.archives-ouvertes.fr/hal-01663598>
- Picard, F. (2013). State of belief, subjective certainty and bliss as a product of cortical dysfunction. *Cortex*, 49(9), 2494–2500.
- Pink-Hashkes, S., van Rooij, I., & Kwisthout, J. (2017). Perception is in the Details: A Predictive Coding Account of the Psychedelic Phenomenon. *CogSci*, 26–29.
- Piper, D. (2004). *90 minutes in heaven: A true story of death & life*. Revell.
- Potts, M. (2012). Does N, N- Dimethyltryptamine (DMT) Adequately Explain Near-Death Experiences ? *31*(1), 3–23.
- Prakash, R., Prakash, O., Shevchenko, N., & Sahay, G. J. (2009). Neural networks for consciousness - providing another dimension to cognitive neurosciences. *Proceedings of the IASTED International Conference Computational Intelligence*.
- Preller, K. H., Razi, A., Zeidman, P., Stämpfli, P., Friston, K. J., & Vollenweider, F. X. (2019). Effective connectivity changes in LSD-induced altered states of consciousness in humans. *Proceedings of the National Academy of Sciences of the United States of America*, 116(7), 2743–2748. <https://doi.org/10.1073/PNAS.1815129116>
- Price, H., H. (1953). Survival and the Idea of "Another World." *Proceedings of the Academy of Psychical Research*, 50(182), 1–25.
- Radin, D. (2009). *Entangled minds: Extrasensory experiences in a quantum reality*. Simon and Schuster.
- Reckweg, J., Mason, N. L., van Leeuwen, C., Toennes, S. W., Terwey, T. H., & Ramaekers, J. G. (2021). A Phase 1, Dose-Ranging Study to Assess Safety and Psychoactive Effects of a Vaporized 5-Methoxy-N,N-Dimethyltryptamine Formulation (GH001) in Healthy

Volunteers. *Frontiers in Pharmacology*, 12, 3340.

<https://doi.org/10.3389/FPHAR.2021.760671/BIBTEX>

- Reckweg, J. T., Uthaug, M. V., Szabo, A., Davis, A. K., Lancelotta, R., Mason, N. L., & Ramaekers, J. G. (2022). The clinical pharmacology and potential therapeutic applications of 5-methoxy-N,N-dimethyltryptamine (5-MeO-DMT). *Journal of Neurochemistry*, 162(1), 128–146. <https://doi.org/10.1111/JNC.15587>
- Reid, A. M., Brown, J. M., Smith, J. M., Cope, A. C., & Jamieson, S. (2018). Ethical dilemmas and reflexivity in qualitative research. *Perspectives on Medical Education*, 7(2), 69–75.
- Reydellet, D., Nutt, D., Carhart-Harris, R., & Timmermann, C. (2022). Source and Connectivity of EEG Activity Induced by DMT [Poster presentation]. *Interdisciplinary Conference on Psychedelic Research, Sep 22nd-24th*.
- Ring, K. (1980). *Life at death: A scientific investigation of the near-death experience*. Coward Mc Cann.
- Ring, K. (1984). *Heading toward omega: In search of the meaning of the near-death experience*. William Morrow & Company.
- Ring, Kenneth. (1988). Prophetic visions in 1988: A critical reappraisal. *Journal of Near-Death Studies*, 7(1), 4–18. <https://doi.org/10.1007/BF01076745>
- Ring, Kenneth. (1992). *The Omega Project: Near-Death Experiences, Ufo Encounters, and Mind at Large*. William Morrow Company.
- Ring, K., & Cooper, S. (2008). *Mindsight: near-death and out-of-body experiences in the blind*. iUniverse.
- Ritchie, G. G., & Sherrill, E. (1978). *Return from Tomorrow*. F.H. Revell.
- Rivas, T. P. M., Dirven, A., & Smit, R. H. (2016). *The self does not die: Verified paranormal phenomena from near-death experiences*. IANDS Publications.
- Robbins, K., & Roe, C. A. (2010). An Empirical Test of the Theory of Morphic Resonance by Using Recognition for Chinese Symbols. *EXPLORE*, 6(4), 256–262. <https://doi.org/10.1016/J.EXPLORE.2010.04.001>

- Rodrigues, A. V. S. L., Almeida, F. J., & Vieira-Coelho, M. A. (2019). Dimethyltryptamine: Endogenous Role and Therapeutic Potential. *Journal of Psychoactive Drugs*, 51(4), 299–310. <https://doi.org/10.1080/02791072.2019.1602291>
- Roe, C., & Hitchman, G. (2011). Testing the theory of morphic resonance using recognition for Chinese symbols: A failure to replicate. *Article in The Journal of the American Society for Psychical Research*. <https://www.researchgate.net/publication/282211570>
- Rogo, D. S. (1984). Ketamine and the near-death experience. *Anabiosis: The Journal for Near-Death Studies*, 4, 87–96.
- Rommer, B. (2000). *Blessing in disguise: Another side of the near-death experience*. Llewellyn.
- Roney-Dougal, S. M., Ryan, A., & Luke, D. (2014). The relationship between local geomagnetic activity and psychic awareness. *Journal of Parapsychology*, 78(2), 235–254.
- Rosanova, M., Fecchio, M., Casarotto, S., Sarasso, S., Casali, A. G., Pigorini, A., Comanducci, A., Seregni, F., Devalle, G., Citerio, G., Bodart, O., Boly, M., Gosseries, O., Laureys, S., & Massimini, M. (2018). Sleep-like cortical OFF-periods disrupt causality and complexity in the brain of unresponsive wakefulness syndrome patients. *Nature Communications* 2018 9:1, 9(1), 1–10. <https://doi.org/10.1038/s41467-018-06871-1>
- Roseman, L., Nutt, D. J., & Carhart-Harris, R. L. (2018). Quality of Acute Psychedelic Experience Predicts Therapeutic Efficacy of Psilocybin for Treatment-Resistant Depression. *Frontiers in Pharmacology*, 8(JAN), 974. <https://doi.org/10.3389/fphar.2017.00974>
- Roseman, L., Haijen, E., Idialu-Ikato, K., Kaelen, M., Watts, R., & Carhart-Harris, R. (2019). Emotional breakthrough and psychedelics: Validation of the Emotional Breakthrough Inventory. *Journal of Psychopharmacology*, 33(9), 1076–1087. <https://doi.org/10.1177/0269881119855974>
- Roseman, L., Ron, Y., Saca, A., Ginsberg, N., Luan, L., & Marcus, O. (2021). Relational Processes in Ayahuasca Groups of Palestinians and Israelis. *Frontiers in Pharmacology*, 12(May), 1–18. <https://doi.org/10.3389/fphar.2021.607529>

- Ross, S., Bossis, A., Guss, J., Agin-Liebes, G., Malone, T., Cohen, B., Mennenga, S. E., Belser, A., Kalliontzi, K., Babb, J., Su, Z., Corby, P., & Schmidt, B. L. (2016). Rapid and sustained symptom reduction following psilocybin treatment for anxiety and depression in patients with life-threatening cancer: A randomized controlled trial. *Journal of Psychopharmacology*, *30*(12), 1165–1180. <https://doi.org/10.1177/0269881116675512>
- Rousseau, D. (2011). Near-Death Experiences and the Mind-Body Relationship: A Systems-Theoretical Perspective Introduction and Background. *Journal of Near-Death Studies*, *29*(3).
- Rousseau, D. (2012). The Implications of Near-Death Experiences for Research into the Survival of Consciousness. *Journal of Scientific Exploration*, *26*(1), 43–80.
- Rushton, N. (2016, May 18). *The Deeper Meaning of Faerie-tales – deadbutdreaming*. <https://deadbutdreaming.wordpress.com/2016/05/08/the-deeper-meaning-of-faerie-tales/?fbclid=IwAR0x1W0QndJI8oDq8BVfC92e2cRaVniefb6HKfFCeSnHZsJ1HYKNfxsGVG0>
- Rushton, N. (2020, July 5). *Faerie Entities and DMT – deadbutdreaming*. <https://deadbutdreaming.wordpress.com/2020/07/05/faerie-entities-and-dmt/>
- Saavedra-Aguilar, J. C., & Gómez-Jeria, J. S. (1989). A neurobiological model for near-death experiences. *Journal of Near-Death Studies*, *7*(4), 205–222.
- Saavedra, J.M., and Axelrod, J. (1972). Psychotomimetic N-methylated tryptamines; formation in brain in vivo and in vitro. *Science*, *172*, 1365–1366.
- Saavedra, J. M., Coyle, J. T., & Axelrod, J. (1973). The distribution and properties of the non-specific N-methyltransferase in brain. *Journal of Neurochemistry*, *20*(3), 743–752. <https://doi.org/10.1111/J.1471-4159.1973.TB00035.X>
- Sabom, M. B. (1982). *Recollections of death: a medical investigation*. Harper and Row.
- Sabom, M. B. (1998). *Light and death: one doctors fascinating account of near-death experiences*. Zondervan Publishing House.
- Sackwild, L., & Stumbrys, T. (2021). The healing and transformative potential of lucid dreaming for treating clinical depression. *IJODR*, *14*, 307–319.

- Saeger, H. N., & Olson, D. E. (2022). Psychedelic-inspired approaches for treating neurodegenerative disorders. *Journal of Neurochemistry*, *162*(1), 109–127. <https://doi.org/10.1111/JNC.15544>
- Sai-Halasz, A., Brunecker, G., & Szara, S. (1958). Dimethyltryptamine, a new psychotogenic agent. *Psychiatria et Neurologia*, *135*, 258–301.
- Sanz, C., Zamberlan, F., Erowid, E., Erowid, F., & Tagliazucchi, E. (2018). The experience elicited by hallucinogens presents the highest similarity to dreaming within a large database of psychoactive substance reports. *Frontiers in Neuroscience*, *12*(JAN), 1–19. <https://doi.org/10.3389/fnins.2018.00007>
- Sartori, P. (2006). A prospective study to investigate the incidence and phenomenology of near-death experiences in a Welsh intensive therapy unit. *Network Review*, *90*, 23–25.
- Sartori, P., Badham, P., Fenwick, P., & Chir, M. B. B. (2006). A Prospectively Studied Near-Death Experience with Corroborated Out-of-Body Perceptions and Unexplained Healing. *Journal of Near-Death Studies*, *25*(2), 69–84. <https://doi.org/https://doi.org/10.17514/JNDS-2006-25-2-p69-84>
- Scarpelli, S., Bartolacci, C., D’Atri, A., Gorgoni, M., & De Gennaro, L. (2019). The functional role of dreaming in emotional processes. In *Frontiers in Psychology* (Vol. 10, Issue MAR, p. 459). <https://doi.org/10.3389/fpsyg.2019.00459>
- Schartner, M. M., Carhart-Harris, R. L., Barrett, A. B., Seth, A. K., & Muthukumaraswamy, S. D. (2017). Increased spontaneous MEG signal diversity for psychoactive doses of ketamine, LSD and psilocybin. *Scientific Reports 2017 7:1*, *7*(1), 1–12. <https://doi.org/10.1038/srep46421>
- Scheidegger, M. (2021). *Neurodynamics of Prosocial Emotional Processing Following Serotonergic Stimulation With N,N-Dimethyltryptamine (DMT) and Harmine in Healthy Subjects (NCT04716335)*. ClinicalTrials.Gov. <https://clinicaltrials.gov/ct2/show/NCT04716335?term=scheidegger+dmT&draw=2&rank=1>
- Schenberg, E. E., Alexandre, J. F. M., Filev, R., Cravo, A. M., Sato, J. R., Muthukumaraswamy, S. D., Yonamine, M., Waguespack, M., Lomnicka, I., Barker, S. A., Da Silveira, D. X., &

- Chialvo, D. R. (2015). Acute Biphasic Effects of Ayahuasca. *PLOS ONE*, *10*(9), e0137202. <https://doi.org/10.1371/JOURNAL.PONE.0137202>
- Schenberg, E. E., de Castro Comis, M. A., Alexandre, J. F. M., Chaves, B. D. R., Tófoli, L. F., & da Silveira, D. X. (2017). Treating drug dependence with the aid of ibogaine: A qualitative study. *Journal of Psychedelic Studies*, *1*(1), 10–19. <https://doi.org/10.1556/2054.01.2016.002>
- Schenberg, E. E., de Castro Comis, M. A., Alexandre, J. F. M., Tófoli, L. F., Chaves, B. D. R., & da Silveira, D. X. (2017). A phenomenological analysis of the subjective experience elicited by ibogaine in the context of a drug dependence treatment. *Journal of Psychedelic Studies*, *1*(2), 74–83. <https://doi.org/10.1556/2054.01.2017.007>
- Schenk, P. W. (1999). The Benefits of Working with a “Dead” Patient: Hypnotically Facilitated Pseudo Near-Death Experiences. *American Journal of Clinical Hypnosis*, *42*(1), 36–49. <https://doi.org/10.1080/00029157.1999.10404243>
- Schlieter, J. (2018). *What is it like to be dead? : Near-death experiences, Christianity, and the Occult*. Oxford University Press.
- Schmid, C. L., & Bohn, L. M. (2010). Serotonin, but not N-methyltryptamines, activates the serotonin 2A receptor via a β -arrestin2/Src/Akt signaling complex in vivo. *Journal of Neuroscience*, *30*(40), 13513–13524.
- Schoeler, T., & Bhattacharyya, S. (2013). The effect of cannabis use on memory function: an update. *Substance Abuse and Rehabilitation*, *4*, 11–27. <https://doi.org/doi:10.2147/SAR.S25869>
- Schwaninger, J., Eisenberg, P. R., Schechtman, K. B., & Weiss, A. N. (2002). A prospective analysis of near-death experiences in cardiac arrest patients. *Journal of Near-Death Studies*, *20*(4), 215–232.
- Scott, G., & Carhart-Harris, R. L. (2019). Psychedelics as a treatment for disorders of consciousness. *Neuroscience of Consciousness*, *2019*(1), 1–8. <https://doi.org/10.1093/nc/niz003>
- Segall, M. T. (2020). *Alchemical Consciousness After Descartes: Whitehead’s Philosophy of*

Organism as Psychedelic Realism.

<https://matthewsegall.files.wordpress.com/2020/10/whitehead-and-psychedelic-realism-long-version.pdf>

Sepeda, N. D., Clifton, J. M., Doyle, L. Y., Lancelotta, R., Griffiths, R. R., & Davis, A. K. (2019). Inhaled 5-methoxy-N,N-dimethyltryptamine: Supportive context associated with positive acute and enduring effects. *Journal of Psychedelic Studies*, 1–9. <https://doi.org/10.1556/2054.2019.033>

Seth, A. K., Barrett, A. B., & Barnett, L. (2011). Causal density and integrated information as measures of conscious level. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 369(1952), 3748–3767. <https://doi.org/10.1098/RSTA.2011.0079>

Seth, A. K., Dienes, Z., Cleeremans, A., Overgaard, M., & Pessoa, L. (2008). Measuring consciousness: relating behavioural and neurophysiological approaches. *Trends in Cognitive Sciences*, 12(8), 314–321. <https://doi.org/10.1016/J.TICS.2008.04.008>

Seth, A. (2021). *Being you: A new science of consciousness*. Penguin.

Shanon, B. (2002). *The antipodes of the mind: Charting the phenomenology of the ayahuasca experience*. Oxford University Press on Demand.

Sheldrake, R. (1988). *The Presence of the Past: Morphic Resonance and the Habits of Nature*. Park Street Press, South Paris, ME.

Sheldrake, Rupert. (1992). An experimental test of the hypothesis of formative causation. *Rivista Di Biologia-Biology Forum*, 86(4), 431–475.

Sheldrake, R. (2011). *The presence of the past: Morphic resonance and the habits of nature*. Icon Books Ltd., London.

Sheldrake, Rupert. (2017, July 10). *Rupert Sheldrake - Psychedelic Experience And Morphic Resonance - YouTube*. YouTube. <https://www.youtube.com/watch?v=8cAYO0Bwpa4>

Shushan, G. (2009). *Conceptions of the afterlife in early civilizations: universalism, constructivism and near-death experience*. A&C Black.

Shushan, G. (2018). *Near-death experience in indigenous religions*. Oxford University Press.

- Shushan, G. (2022). *The Next World: Extraordinary Experiences of the Afterlife*. White Crow Books.
- Siegel, R. K., Brewster, J. M., Johnson, C. A., & Jarvik, M. E. (1976). The effects of hallucinogens on blind monkeys. *International Pharmacopsychiatry*, 11(3), 150–156. <https://doi.org/10.1159/000468224>
- Singer, T. (2006). The neuronal basis and ontogeny of empathy and mind reading: review of literature and implications for future research. *Neurosci Biobehav Rev.*, 30(6), 855–63.
- Sledge, M., & Grim, R. (2013). *If you haven't heard of DMT Yet, you might soon*. Huffington Post. https://www.huffingtonpost.co.uk/entry/dmt-use_n_4412633
- Smigielski, L., Scheidegger, M., Kometer, M., & Vollenweider, F. X. (2019). Psilocybin-assisted mindfulness training modulates self-consciousness and brain default mode network connectivity with lasting effects. *NeuroImage*, 196, 207–215. <https://doi.org/10.1016/J.NEUROIMAGE.2019.04.009>
- Smith, C. (2021, May 7). *The Cutting Edge of Psychedelic Science (06/05/21) - Oxford Psychedelic Society*. YouTube.Com. <https://www.youtube.com/watch?v=AdvDYXzh-qc>
- Smith, H. (1964). Do drugs have religious import? *The Journal of Philosophy*, 61(18), 517–530.
- Smith, P. (2019, November 27). *Patrick Smith - Salvia divinorum and "The Wheel": What Can We Learn From This Persistent Phenomenon?* YouTube. <https://www.youtube.com/watch?v=kiCoqLkb79E&list=PLSoL-fGoUnxB4dn8dk6tApvV3FY5ylmed&index=19&t=10s>
- Sogyal, R. (1992). *The Tibetan book of living and dying* (P. Gaffney & A. Harvey (Eds.)). Rider.
- Solms, M. (2021). *The hidden spring: A journey to the source of consciousness*. WW Norton & Company.
- Solms, Mark, & Friston, K. (2018). How and why consciousness arises: some considerations from physics and physiology. *Journal of Consciousness Studies*, 25((5-6)), 202-238.
- Speth, J., Speth, C., Kaelen, M., Schloerscheidt, A. M., Feilding, A., Nutt, D. J., & Carhart-Harris, R. L. (2016). Decreased mental time travel to the past correlates with default-

mode network disintegration under lysergic acid diethylamide. *Journal of Psychopharmacology*, 30(4), 344–353.

https://doi.org/10.1177/0269881116628430/ASSET/IMAGES/LARGE/10.1177_0269881116628430-FIG2.JPEG

Splittgerber, F. (1866). *Schlaf und Tod [Sleep and Death]*. Julius Fricke.

St John, G. (2015). *Mystery School in Hyperspace*. Evolver Editions.

St John, G. (2018). The Breakthrough Experience: DMT Hyperspace and its Liminal Aesthetics. *Anthropology of Consciousness*, 29(1), 57–76.
<https://doi.org/10.1111/anoc.12089>

Stace, W. T. (1960). *Mysticism and philosophy*. Lippincot.

Steiner, J., Erritzoe, D., & Boyce, M. (2020). *SPL026 (DMT Fumarate) in Healthy Subjects and MDD Patients (NCT04673383)*. ClinicalTrials.Gov.
<https://clinicaltrials.gov/ct2/show/NCT04673383?term=steiner%2C+dmf&draw=2&rank=1>

Stevenson, I., Cook, E., & McClean-Rice, N. (1989). Are persons reporting “near-death experiences” really near death? A study of medical records. *Omega*, 20, 45–54.

Stiefel, K. M., Merrifield, A., & Holcombe, A. O. (2014). The claustrum’s proposed role in consciousness is supported by the effect and target localization of *Salvia divinorum*. *Frontiers in Integrative Neuroscience*, 8(FEB), 1–7.
<https://doi.org/10.3389/fnint.2014.00020>

Stoliker, D., Novelli, L., Vollenweider, F. X., Egan, G. F., Preller, K. H., & Razi, A. (2022). Effective connectivity of LSD-induced ego dissolution. *MedRxiv*, 2021.12.28.21268391.
<https://doi.org/10.1101/2021.12.28.21268391>

Storm, H. (2005). *My descent into death: A second chance at life*. Doubleday.

Strassman, Rick J., & Qualls, C. R. (1994). Dose-Response Study of N,N-Dimethyltryptamine I. Neuroendocrine, Autonomic, and Cardiovascular Effects. *Archives of General Psychiatry*, 51(FEB).

Strassman, Ruck J., Qualls, C. R., Uhlenhuth, E. H., & Kellner, R. (1994). Dose-Response Study

- of N,N-Dimethyltryptamine in Humans: II. Subjective Effects and Preliminary Results of a New Rating Scale. *Archives of General Psychiatry*, 51(2), 98–108.
<https://doi.org/10.1001/archpsyc.1994.03950020022002>
- Strassman, Rick. (2001). *DMT: The spirit molecule: A doctor's revolutionary research into the biology of near-death and mystical experiences*. Park Street Press.
- Strassman, R, Wojtowicz, S., Luna, L., & Frecska, E. (2008). *Inner paths to outer space: Journeys to alien worlds through psychedelics and other spiritual technologies*. Simon and Schuster.
- Strassman, R. (2014). *DMT and the soul of prophecy: A new science of spiritual revelation in the Hebrew Bible*. Simon and Schuster.
- Streiber, W. (2022). Stories from a Life: a Lifetime of Anomalous and Unexplained Experiences. In David Luke & R. Spowers (Eds.), *DMT entity encounters: Dialogues on the spirit molecule*. Park Street Press.
- Strieber, W., & Kripal, J. J. (2016). *The super natural: A new vision of the unexplained*. Jeremy P. Tarcher-Penguin.
- Strubelt, S., & Maas, U. (2008). The Near-Death Experience - A Cerebellar Method to Protect Body and Soul - Lessons from the Iboga Healing Ceremony in Gabon. *Alternative Therapies in Health & Medicine*, 14(1).
- Sutherland, C. (1989). Psychic phenomena following near-death experiences: An Australian study. *Journal of Near-Death Studies*, 8(2), 93–102.
<https://doi.org/10.1007/BF01077504>
- Sutherland, C. (1990). Changes in religious beliefs, attitudes, and practices following near-death experiences: An Australian study. *Journal of Near-Death Studies*, 9(1), 21–31.
<https://doi.org/10.1007/BF01074098>
- Swanson, J. M., & Kinsbourne, M. (1976). Stimulant-related state-dependent learning in hyperactive children. *Science*, 4246(192), 1354–1357.
- Szabo, A., Kovacs, A., Frecska, E., & Rajnavolgyi, E. (2014). Psychedelic N,N-Dimethyltryptamine and 5-Methoxy-N,N-Dimethyltryptamine Modulate Innate and

Adaptive Inflammatory Responses through the Sigma-1 Receptor of Human Monocyte-Derived Dendritic Cells. *PLOS ONE*, 9(8), e106533.

<https://doi.org/10.1371/JOURNAL.PONE.0106533>

Szabo, A., & Frecska, E. (2016). Dimethyltryptamine (DMT): A biochemical Swiss Army knife in neuroinflammation and neuroprotection? *Neural Regeneration Research*, 11(3), 396–397. <https://doi.org/10.4103/1673-5374.179041>

Szabo, A., Kovacs, A., Riba, J., Djurovic, S., Rajnavolgyi, E., & Frecska, E. (2016). The endogenous hallucinogen and trace amine N,N-dimethyltryptamine (DMT) displays potent protective effects against hypoxia via sigma-1 receptor activation in human primary iPSC-derived cortical neurons and microglia-like immune cells. *Frontiers in Neuroscience*, 10(SEP), 1–11. <https://doi.org/10.3389/fnins.2016.00423>

Szára, S. (2014). *Interview conducted by email on the discovery of DMT and speculations regarding the phenomenology of the experience* (Andrew R. Gallimore & D. Luke (Eds.)).

Tagliazucchi, E., Carhart-Harris, R., Leech, R., Nutt, D., & Chialvo, D. R. (2014). Enhanced repertoire of brain dynamical states during the psychedelic experience. *Human Brain Mapping*, 35(11), 5442–5456. <https://doi.org/10.1002/HBM.22562>

Tagliazucchi, E., Roseman, L., Kaelen, M., Orban, C., Muthukumaraswamy, S. D., Murphy, K., Laufs, H., Leech, R., McGonigle, J., Crossley, N., Bullmore, E., Williams, T., Bolstridge, M., Feilding, A., Nutt, D. J., & Carhart-Harris, R. (2016). Increased Global Functional Connectivity Correlates with LSD-Induced Ego Dissolution. *Current Biology*, 26(8), 1043–1050. <https://doi.org/10.1016/J.CUB.2016.02.010>

Tagliazucchi, E., Zamberlan, F., Cavanna, F., De La Fuente, L., Romero, C., Sanz Perl, Y., & Pallavicini, C. (2021). Baseline power of theta oscillations predicts mystical-type experiences induced by DMT. *BioRxiv*, 2021.03.11.434994.

<https://doi.org/10.1101/2021.03.11.434994>

Takahata, K., & Kato, M. (2008). Neural mechanism underlying autistic savant and acquired savant syndrome. *Brain and Nerve = Shinkei Kenkyu No Shinpo*, 60(7), 861–869.

Taylor, J. B. (2009). *My stroke of insight*. Hachette UK.

- Thomas, S. (2004). *Agmatine and near-death experiences*.
<http://www.neurotransmitter.net/neardeath.html>
- Timmermann, Chris. (2017). Brain Activity and Extraordinary Experiences Induced by DMT.
UCL Society for the Application of Psychedelics, 23rd October.
- Timmermann, Christopher, Roseman, L., Williams, L., Erritzoe, D., Martial, C., Cassol, H., Laureys, S., Nutt, D., & Carhart-Harris, R. (2018). DMT models the near-death experience. *Frontiers in Psychology, 9*(AUG), 1–12.
<https://doi.org/10.3389/fpsyg.2018.01424>
- Timmermann, Christopher, Roseman, L., Schartner, M., Milliere, R., Williams, L. T. J., Erritzoe, D., Muthukumaraswamy, S., Ashton, M., Bendrioua, A., Kaur, O., Turton, S., Nour, M. M., Day, C. M., Leech, R., Nutt, D. J., & Carhart-Harris, R. L. (2019). Neural correlates of the DMT experience assessed with multivariate EEG. *Scientific Reports, 9*(1), 1–13. <https://doi.org/10.1038/s41598-019-51974-4>
- Timmermann, Christopher. (2019). The Neuroscience of DMT: Imperial College Research.
The Experimental Thought Co., 4th June.
- Timmermann, Christopher, Watts, R., & Dupuis, D. (2020). Towards psychedelic apprenticeship: Developing a gentle touch for the mediation and validation of psychedelic-induced insights and revelations. *Transcultural Psychiatry, December*, 1–29. <https://psyarxiv.com/j5768/>
- Timmermann, Christopher, Kettner, H., Letheby, C., Roseman, L., Rosas, F. E., & Carhart-Harris, R. L. (2021). Psychedelics alter metaphysical beliefs. *Scientific Reports 2021 11:1, 11*(1), 1–13. <https://doi.org/10.1038/s41598-021-01209-2>
- Timmermann, Christopher. (2022). At the Far Reaches of Consciousness Exploration: Preliminary findings of extended infusions of DMT. *A Tyringham Initiative Symposium: Exploring the Presence of the Sentient Other, Broughton Hall, 28th Sep-1st Oct*.
- Tononi, Giulio, Edelman, G. M., & Sporns, O. (1998). Complexity and coherency: integrating information in the brain. *Trends in Cognitive Sciences, 2*(12), 474–484.
[https://doi.org/10.1016/S1364-6613\(98\)01259-5](https://doi.org/10.1016/S1364-6613(98)01259-5)

- Tononi, Giulio. (2004). An information integration theory of consciousness. *BMC Neuroscience*, 5(1), 1–22. <https://doi.org/10.1186/1471-2202-5-42/FIGURES/5>
- Tononi, G. (2012). *Phi: A Voyage from the Brain to the Soul*. Pantheon books, New York, NY.
- Tononi, Giulio, Boly, M., Massimini, M., & Koch, C. (2016). Integrated information theory: from consciousness to its physical substrate. *Nature Reviews Neuroscience* 2016 17:7, 17(7), 450–461. <https://doi.org/10.1038/nrn.2016.44>
- Torda, C. (1968). Contribution to serotonin theory of dreaming (LSD infusion). *New York State Journal of Medicine*, 68(9), 1135–1138.
- Tramacchi, D. (2006). *Vapours and visions Religious dimensions of DMT use* (Issue June). University of Queensland.
- Turner, W., & Merlis, S. (1959). Effect of Some Indolealkylamines on Man. *A. M. A. Archives of Neurology and Psychiatry*, 81, 121–129.
- Turton, S., Nutt, D. J., & Carhart-Harris, R. L. (2014). A qualitative report on the subjective experience of intravenous psilocybin administered in an fMRI environment. *Current Drug Abuse Reviews*, 7(2), 117–127. <https://doi.org/10.2174/1874473708666150107120930>
- Urgesi, C., Aglioti, S. M., Skrap, M., & Fabbro, F. (2010). The Spiritual Brain: Selective Cortical Lesions Modulate Human Self-Transcendence. *Neuron*, 65(3), 309–319. <https://doi.org/10.1016/J.NEURON.2010.01.026>
- Uthaug, M. V., Lancelotta, R., van Oorsouw, K., Kuypers, K. P. C., Mason, N., Rak, J., Šuláková, A., Jurok, R., Maryška, M., Kuchař, M., Páleníček, T., Riba, J., & Ramaekers, J. G. (2019). A single inhalation of vapor from dried toad secretion containing 5-methoxy-N,N-dimethyltryptamine (5-MeO-DMT) in a naturalistic setting is related to sustained enhancement of satisfaction with life, mindfulness-related capacities, and a decrement of psych. *Psychopharmacology*, 236(9), 2653–2666. <https://doi.org/10.1007/s00213-019-05236-w>
- Uthaug, Malin V., Lancelotta, R., Szabo, A., Davis, A. K., Riba, J., & Ramaekers, J. G. (2020). Prospective examination of synthetic 5-methoxy-N,N-dimethyltryptamine inhalation:

- effects on salivary IL-6, cortisol levels, affect, and non-judgment. *Psychopharmacology*, 237(3), 773–785. <https://doi.org/10.1007/s00213-019-05414-w>
- Vallee, J. (1969). *Passport to Magonia: From folklore to flying saucers*. H. Regnery Company.
- Vallee, Jacques. (1993). *Passport To Magonia: On UFOs, Folklore, And Parallel Worlds*. McGraw-Hill Contemporary.
- van Heugten-van der Kloet, D., & Lynn, S. J. (2020). Dreams and Dissociation—Commonalities as a Basis for Future Research and Clinical Innovations. *Frontiers in Psychology*, 11, 745. <https://doi.org/10.3389/FPSYG.2020.00745/BIBTEX>
- Van Hoeck, N., Ma, N., Ampe, L., Baetens, K., Vandekerckhove, M., & Van Overwalle, F. (2013). Counterfactual thinking: An fMRI study on changing the past for a better future. *Social Cognitive and Affective Neuroscience*, 8(5), 556–564. <https://doi.org/10.1093/scan/nss031>
- van Lommel, P. (2010). *Consciousness Beyond Life: The Science of the Near-Death Experience*. HarperOne.
- Van Lommel, Pim. (2002). Near-death experience in survivors of cardiac arrest. A study in the Netherlands. *Biomedicine and Pharmacotherapy*, 56(3), 164.
- van Rijn, C. M., Krijnen, H., Menting-Hermeling, S., & Coenen, A. M. L. (2011). Decapitation in rats: Latency to unconsciousness and the “wave of death.” *PLoS ONE*, 6(1), 1–6. <https://doi.org/10.1371/journal.pone.0016514>
- Vann Jones, S. A., & O’Kelly, A. (2020). Psychedelics as a Treatment for Alzheimer’s Disease Dementia. *Frontiers in Synaptic Neuroscience*, 12, 34. <https://doi.org/10.3389/FNSYN.2020.00034/BIBTEX>
- Varela, F. J. & Shear, J. (1999). First-person methodologies: What, why, how? *J. Conscious. Stud.*, 6, 1–14.
- Varley, J. (2019). Psychedelic-assisted therapy for anxiety and depression in the face of death: A critical review with an anthropological lens. *Journal of Psychedelic Studies*, 3(1), 14–18. <https://doi.org/10.1556/2054.2019.005>
- Vicente, R., Rizzuto, M., Sarica, C., Yamamoto, K., Sadr, M., Khajuria, T., Fatehi, M., Moien-

Afshari, F., Haw, C. S., Llinas, R. R., Lozano, A. M., Neimat, J. S., & Zemmar, A. (2022). Enhanced Interplay of Neuronal Coherence and Coupling in the Dying Human Brain. *Frontiers in Aging Neuroscience*, 14(February), 1–11.
<https://doi.org/10.3389/fnagi.2022.813531>

Vincent, S., & O'Mahoney, J. (2018). Critical Realism and Qualitative Research: An introductory Overview. In C. Cassell, A. Cunliffe, & G. Grady (Eds.), *The Sage Handbook of Qualitative Business and Management Research Methods*. Sage.
<http://dx.doi.org/10.1016/j.cirp.2016.06.001><http://dx.doi.org/10.1016/j.powtec.2016.12.055><https://doi.org/10.1016/j.ijfatigue.2019.02.006><https://doi.org/10.1016/j.matlet.2019.04.024><https://doi.org/10.1016/j.matlet.2019.127252><http://dx.doi.org>

Viol, A., Palhano-Fontes, F., Onias, H., De Araujo, D. B., & Viswanathan, G. M. (2017). Shannon entropy of brain functional complex networks under the influence of the psychedelic Ayahuasca. *Scientific Reports* 2017 7:1, 7(1), 1–13.
<https://doi.org/10.1038/s41598-017-06854-0>

Vollenweider, F. X., Leenders, K. L., Scharfetter, C., Maguire, P., Stadelmann, O., & Angst, J. (1997). Positron Emission Tomography and Fluorodeoxyglucose Studies of Metabolic Hyperfrontality and Psychopathology in the Psilocybin Model of Psychosis. *Neuropsychopharmacology* 1997 16:5, 16(5), 357–372. [https://doi.org/10.1016/s0893-133x\(96\)00246-1](https://doi.org/10.1016/s0893-133x(96)00246-1)

Vollenweider, Franz X., & Smallridge, J. W. (2022). Classic Psychedelic Drugs: Update on Biological Mechanisms. *Pharmacopsychiatry*, 55(3), 121–138.
<https://doi.org/10.1055/a-1721-2914>

Watts, A. (1989). *The Book: On the taboo against knowing who you are*. Randomhouse.

Watts, R., Day, C., Krzanowski, J., Nutt, D., & Carhart-Harris, R. (2017). Patients' Accounts of Increased "Connectedness" and "Acceptance" After Psilocybin for Treatment-Resistant Depression. *Journal of Humanistic Psychology*, 57(5), 520–564.
<https://doi.org/10.1177/0022167817709585>

Watts, R., & Luoma, J. B. (2020). The use of the psychological flexibility model to support

- psychedelic assisted therapy. *Journal of Contextual Behavioral Science*, 15(December 2019), 92–102. <https://doi.org/10.1016/j.jcbs.2019.12.004>
- Weingartner, H., Adefris, W., Eich, J. E., & Al., E. (1976). Encoding-imagery specificity in alcohol state-dependent learning. *Journal of Experimental Psychology-Human Learning and Memory*, 1(2), 83–87.
- Whitehead, A. N. (1947). *Essays in Science and Philosophy*. Greenwood Press.
- Whitfield, H. J. (2021). A Spectrum of Selves Reinforced in Multilevel Coherence: A Contextual Behavioural Response to the Challenges of Psychedelic-Assisted Therapy Development. *Frontiers in Psychiatry*, 12(December), 1–19. <https://doi.org/10.3389/fpsy.2021.727572>
- Wilkins, L. K., Girard, T. A., & Cheyne, J. A. (2011). Ketamine as a primary predictor of out-of-body experiences associated with multiple substance use. *Consciousness and Cognition*, 20, 943–950.
- Wilkinson, S. (2000). Women with breast cancer talking causes: comparing content, biographical and discursive analyses. *Eminism & Psychology*, 10(4), 431–460.
- Williams, G. V., Rao, S. G., & Goldman-Rakic, P. S. (2002). The Physiological Role of 5-HT_{2A} Receptors in Working Memory. *Journal of Neuroscience*, 22(7), 2843–2854. <https://doi.org/10.1523/JNEUROSCI.22-07-02843.2002>
- Winkelman, M. (2002). Shamanism as Neurotheology and Evolutionary Psychology. *American Behavioural Scientist*, 45(12), 1875–1887.
- Winkelman, M. (2013). The Integrative Mode of Consciousness: Evolutionary Origins of Ecstasy. In T. Passie, W. Belschner, & E. Petrow (Eds.), *Ekstasen: Kontexte – Formen – Wirkungen* (pp. 67–83). Würzburg.
- Winkelman, Michael J. (2017). The mechanisms of psychedelic visionary experiences: Hypotheses from evolutionary psychology. *Frontiers in Neuroscience*, 11(SEP). <https://doi.org/10.3389/fnins.2017.00539>
- Winkelman, Michael James. (2018). An ontology of psychedelic entity experiences in evolutionary psychology and neurophenomenology. *Journal of Psychedelic Studies*,

2(1), 5–23. <https://doi.org/10.1556/2054.2018.002>

Winkelman, Michael J. (2019). The evolutionary origins of the supernatural in ritual behaviours. *The Supernatural After the Neuro-Turn*, 48–68.

<https://doi.org/10.4324/9780429456930-4>

Winstock, A. R., Kaar, S., & Borschmann, R. (2014). Dimethyltryptamine (DMT): Prevalence, user characteristics and abuse liability in a large global sample. *Journal of Psychopharmacology*, 28(1), 49–54. <https://doi.org/10.1177/0269881113513852>

Witting, L. (2010). *NDE Radio*. IANDS.

Wolff, T. J., Ruffell, S., Netzband, N., & Passie, T. (2019). A phenomenology of subjectively relevant experiences induced by ayahuasca in Upper Amazon vegetalismo tourism. *Journal of Psychedelic Studies*, 3(3), 295–307. <https://doi.org/10.1556/2054.2019.007>

Woollacott, M., & Peyton, B. (2021). Verified account of near-death experience in a physician who survived cardiac arrest. *EXPLORE*, 17(3), 213–219.

Wren Lewis, J. (1995). *The Dazzling Dark: A Near-Death Experience Opens the Door to a PERMANENT TRANSFORMATION*. <https://www.nonduality.com/dazdark.htm>

Wulff, D. M. (2000). Mystical experienc. In E. Cardeña, S. J. Lynn, & S. Krippner (Eds.), *Varieties of anomalous experience: Examining the scientific evidence* (pp. 397–440). American Psychological Association.

Wyllie, T. (1981). *Phencyclidine and ketamine: A view from the street [Unpublished manuscript]*. <http://www.timothywyllie.com/PCP.htm>

Yaden, D. B., Johnson, M. W., Griffiths, R. R., Doss, M. K., Garcia-Romeu, A., Nayak, S., Gukasyan, N., Mathur, B. N., & Barrett, F. S. (2021). Psychedelics and Consciousness: Distinctions, Demarcations, and Opportunities. *International Journal of Neuropsychopharmacology*, 24(8), 615–623. <https://doi.org/10.1093/ijnp/pyab026>

Yalom, I. D. (1980). *Existential Psychotherapy*. Basic Books.

Yanakieva, S., Polychroni, N., Family, N., Williams, L. T. J., Luke, D. P., & Terhune, D. B. (2019). The effects of microdose LSD on time perception: a randomised, double-blind, placebo-controlled trial. *Psychopharmacology*, 236(4), 1159–1170.

<https://doi.org/10.1007/S00213-018-5119-X/FIGURES/2>

Zaleski, C. (1987). *Otherworld Journeys: Accounts of Near-Death Experience in Medieval and Modern Times*. Oxford University Press.

Zeifman, R. J., Palhano-Fontes, F., Hallak, J., Arcoverde, E., Maia-Oliveira, J. P., & Araujo, D. B. (2019). The impact of ayahuasca on suicidality: Results from a randomized controlled trial. *Frontiers in Pharmacology*, *10*(November), 1–10.

<https://doi.org/10.3389/fphar.2019.01325>

Zhang, Y., Li, Z., Zhang, J., Zhao, Z., Zhang, H., Vreugdenhil, M., & Lu, C. (2019). Near-death high-frequency hyper-synchronization in the rat hippocampus. *Frontiers in Neuroscience*, *13*(JUL), 1–9. <https://doi.org/10.3389/fnins.2019.00800>

Appendices

Appendix A: Chapter III

1.

Encountering Other Beings

Interaction & Behaviour: Entities as Interfacing or Independent

Much of the entities' interactions with the experiencers have been subsumed by the broader concepts captured by the **Roles**. However, many are best left surviving as modes of *Active involvement* in their own right, such as a couple of psychonauts reporting some phenomenological correlates of 'possession' (2), like RH (Trip 3; 55-59y, M, Asian British – Indian descent):

"I knew I was human...but...I'm a creature, experiencing this. In fact...it was saying through me, like it was taking over me and saying, 'Oh it's very beautiful here isn't it'... It's like its able to see through our consciousness, able to experience with us... I've become like an alien or something, that I'm using this person's form in order to experience the world... I didn't really feel like me, I was and I wasn't, but mostly I wasn't, I was something else. And I know [this being]... "I" just wanted to experience the world and it seemed like that was the job, to come into these bodies and experience the world"

Passive activity of the beings, as they naturally behaved, most commonly meant encounters unfolding under the gaze of the entities, 'watching' (9) the participants, as referenced by two aforementioned exemplars of curiosity; RH mentions animal-like pod-beings "coming from here and looking down into this universe... And they were looking down, as they were upside down...into me and around me at this universe". A passive 'laughing or smiling' (7) at or with the experiencers followed, naturally aligning with the vastly positive encounters – though sometimes the laughter surrounds the impish energy of the beings, as already elaborated in PD's trip with his alluring giggling God-child.

Several DMT experiencers were witness to 'dancing' entities (5), for instance MB relates a host of harlequin-esque morph-suits "dancing around...they had all those silks from aerial [gymnastics] ...playing with ribbons." Her hosts' "purpose was to make sure every single corner is as pretty as can be", choregraphing themselves to 'beautify' (2) her DMT environs, as well as apparently doing a spot of 'gardening' (3) "watering different points...and pouring things...with these tiny tubes – they were doing this thing [mimes a tipping hand]". This was also echoed by JM's entities, similarly featureless fools hinting at the zodiac symbol of "Aquarius, pouring...at one point as if it were poured over [me]" – as well as BC who mentions another clown-like personage contortedly offering him "a very mini oil barrel". As with MB's hurrying harlequins 'jumping around' (3), "moving closer to me then moving

further away... kept on spinning around”, so too did GC’s (Trip 2) clowns display this frenetic energy, “floating, jumping around... they’re moving very fast...flying over me”.

2.

Exploring Other Worlds

Typically, this occurs in the first instance via a felt sense of some trajectory of travel (‘Translocation’ subtheme, elaborated in the subsequent report with the near-death experience) – however, eight psychonauts specifically address the idea of breaching some threshold; a *Breaking through the veil*, with allusions to piercing the kaleidoscopic membrane only in a minority. Notably, virtually all these experients articulate the breakthrough in terms of a “letting go” during this struggle to facilitate the process. In both GC’s first and second trips he felt and saw himself desperately convulse (purely subjectively), which he interpreted as attempts of his mind to evacuate the body, or surpass the ego:

“And then it was like very strange fight, I was trying to break this reality, to come out of my body and go there... This was my breakthrough basically, my fight to go from this reality to that one... Then the seizures start... I had that kind of seizure maybe, uncontrollable movements... somehow, I’ve the feeling I had a fight with me, my ego, somehow... I think this seizure was in fact my [breakthrough attempt]” (GC, Trip 1)

Finally, again, BB (35-39y, M, White British) resounds this need to let go before progressing onward, which in turn precedes another liberation after seizing the message of the encounter:

“But I had to let go of something before I could get there... it felt like it was coming there just to pass on a message. Then it was sort of done, it said what it came to say... almost this urgency with which it came. As soon as I was ready, it was just BANG, there... Once I had that very strong feeling – and felt like that was the message it passed on, and it was very clear and obvious – it freed me up again to do what I wanted I guess, within the space, within the feeling”

Most of the experients echoed the sentiment that they underwent an *Emergence into novel reality* – inspired by PD’s couching the archetype of this dramatic spiriting away, as he shed off consensus reality, as just “like Dorothy” (from ‘The Wizard of Oz’). While 100% did describe being in a different space of some description, twenty-one made explicit reference to being taken from their normal environs to be “off into another realm of consciousness” (JR) – or as AZ neatly puts it, “it wasn’t what I had seen, but somewhere I had been!” MB, despite admitting her default scepticism, perhaps most clearly makes use of verbal parallels to explain such parallel worlds:

“I was like Oh right! There's this reality! Yeah, right, I've made contact with this reality... I’m not a fan of this theory, but [it was] as if I was tuning in to something different. You have a radio station... It’s as if I was experiencing a completely different reality but I was still here at the same time. Like putting on a VR headset really – [that’s] the best metaphor”

The suddenness of this transition, and the nature of the destination itself, are often described as especially shocking:

“I definitely was not present in this [gestures to room], I was there in that incredible, quite terrifying, but mind-blowing environment... That initial fear is just because it’s so- you’re just taken out, you know I’m sitting here in a house and suddenly you’re not!... you’re in a completely- and it’s all moving, you know you’re transported instantly and it’s all going on around you, it’s like *Zoom, zoom, zoom* and it’s like Fuuuuck!” (FF)

This process, core to the breakthrough DMT experience, had a somewhat different dimension in the case of RH's first trip, where it was not only he who journeyed to other worlds, but his otherworldly companions bled into this one:

"I knew that only right now is it possible for [the entities] to see into this world... I hear myself saying, 'Come anytime you want'... They're looking down into me and around me at this universe...through some sort of thing we'd call a window I guess – about here, up and to the right... This feminine entity [is] giving me the impression that I'm helping to create a gateway, that I'm opening up a gateway for experience... So it doesn't feel like a one way street, it's not just me going out there."

Eleven psychonauts described a *Navigation through space*; consciously negotiating their way through their new-found worlds. The majority were "just flying through these dimensions" (LR), with movement of the essence of 'floating' (8). PD loans from his conceptual repertoire to articulate this sense of exploration:

"I was able to move around this splintered situation, and there was definitely...I fucking use drones a lot obviously – imagine a drone following along a pathway with a woman walking with a pram, right? And the drone's following, so a 3rd-person like an out-of-body perspective, I was following this person, *Shwoosh*"

Both MB and MT used resoundingly similar imagery of their floating through a space, somehow mediated by the space itself, which they likened to a "house" or "rooms" – both also incorporating a tunnel-like experience, as MT gave the following when asked if it was related to the "vortices" she mentioned earlier:

"Yeah! It was the...undulation of what was happening that was moving...my consciousness... I had a bit of a choice to go with the current or resist it, but definitely the way the shapes were moving was creating the movement, the pull, and I let my consciousness go into that... you'd follow one energy or hallway or doorway or something and it would *Shhww*, open you up into another space"

3.

Table of all super-ordinate, mid-level and subthemes

An Encounter with the Other	Clarificatory notes	No. Interviews /36 (%)
<u>Encountering Other Beings</u>		
<i>Transformation of persons present</i>		7 (19)
<i>DMT personification</i>	Referring to ‘the DMT’ itself (or its essence) as having agency	5 (14)
Sensed Presence		
Presences (No imagery)		6 (17)
Omnipresence		5 (14)
Role & Function		
<i>Helping or nurturing</i>		
The Guide	Assisting the experiencers in their journey, inviting them in and showing them their world	8 (14)
The Soother	Reassuring	5 (14)
The Playmate	Playing	5 (14)
The Guardian	Protecting	5 (14)
The Healer	Cleansing or repairing, may involve scanning or attempt at resuscitation	4 (11)

The Muse	Inspiring	1 (3)
<i>Showing or communing</i>		17 (47)
The Presenter	Offering	10 (28)
The Teacher	Explaining	9 (25)
The Focuser	Directing attention	5 (14)
<i>Manipulating or controlling</i>		6 (17)
The Trickster	Comprising the actions and disposition of being mischievous, childish, tempting and laughing at (or joking with) the experient	3 (8)
The Experimenter	Studying the experient, which may involve a clinical scenario, preparing or paralysing them	2 (6)
The Orchestrator	Creating, controlling or holding space	2 (6)
The Consumer	Eating	1 (3)
Appearance & Features		
Human	Mostly unknown to participant	6 (17)
Other animals	e.g. snakes	4 (11)
<i>Otherly Creatures – Non-human/Non-animal</i>		26 (72)
Humanoid		9 (25)
Silhouettes / Featureless		8 (22)

Clown-like / Jester		4 (11)
Octopoid		4 (11)
Insectoid		4 (11)
Serpentine		3 (8)
'The Grey- or Mantis'-like	Elongated head/eyes/hands (though re Greys: <i>without</i> short height or grey skin of iconic lore)	2 (6)
Therianthropic	Entities have animalistic appearance, which they may shift between	2 (6)
Baby		2 (6)
'Me' or Autoscopy		2 (6)
Succubus / Unevolved spirits		2 (6)
'Navi'-esque	From the movie Avatar	1 (3)
Doctor / Scientist		1 (3)
Space invader-like		1 (3)
Synapse-like		1 (3)
Faerie-like	Though <i>elf-like</i> in terms of faerie/animal-like face (as well as trickster-like behaviour), not 'little' as per 'little people' of DMT lore	1 (3)
Indigenous spirit	Spirit guide of Barquinha cosmology	1 (3)

Disembodied eyes	Comprised of thousands of eyes	1 (3)
Hooded figures		1 (3)
Stick creature		1 (3)
Bottle-like		1 (3)
<i>Sentient structures</i>		9 (25)
Sentient geometry		3 (8)
Building / Structure (Sentient)		3 (8)
Computer symbols/presence		2 (6)
Aztec patterns		1 (3)
Boxes		1 (3)
Candy cane / Pipes		1 (3)
<i>Specific features</i>		9 (25)
Face(s) <i>only</i>		2 (6)
Hand(s) <i>only</i>		2 (6)
Voice <i>only</i>		1 (3)
Mobius strip		1 (3)
Multi-cultural	Various guides of different cultural heritage	1 (3)
Planet-sized		1 (3)
Winged		1 (3)
Chained		1 (3)
Pods		1 (3)

<i>Visual quality</i>		19 (53)
Self-transforming		8 (22)
Geometric		8 (22)
Cartoon-like / 2D		6 (17)
Colourful		5 (14)
Mechanical		3 (8)
Hyperdimensional		3 (8)
Hideous		1 (3)
High-Definition		1 (3)
Holographic		1 (3)
Metallic		1 (3)
Organic-mechanic		1 (3)
Demeanour & Nature		
<i>Charming and Inviting</i>		20 (56)
Benevolent / Loving		10 (28)
Benign / Friendly		9 (25)
Jovial / Happy		4 (11)
Motherly		3 (8)
Graceful		1 (3)
Sensual		1 (3)
<i>Other dispositions</i>		12 (33)
Curious		4 (11)

Childish		3 (8)
Urging		2 (6)
Panicking		1 (3)
Secretive		1 (3)
Confused		1 (3)
Stubborn		1 (3)
Aware of those present		1 (3)
Unaware of those present	Entities not cognizant of others in the room such as researchers or participants' friends	1 (3)
<i>Mischievous or Jestful</i>		5 (14)
<i>Fearsome or Menacing</i>		3 (8)
<i>Nature</i>		17 (47)
One with or of the Beings		10 (28)
Familiar		10 (28)
Hyper-intelligent		7 (19)
Beautiful or Extraordinary		4 (11)
Powerful		2 (6)
<i>Expecting subject</i>		6 (17)
Did not expect		3 (8)
Expected		3 (8)
<i>Gender</i>		17 (47)

Feminine		14 (39)
Masculine		7 (19)
None		1 (3)
Communication & Messages		
<i>Communication mode</i>		14 (39)
Intuition or Telepathy		13 (36)
Dance & Gesticulation		3 (8)
Visual communication		2 (6)
Contactability post-trip		1 (3)
Potentially communicative		1 (3)
<i>Messages received</i>		13 (36)
'The Cosmic Game' or 'Cosmic Giggle'	<i>The message that the universe is a vast, unified playground for beings to enjoy, and/or possesses an inherent sense of humour</i> [An extension of <i>Insight into World below</i>]	5 (14)
Love for Others and Self	'Just Love' ; 'Love yourself' ; 'Don't take people for granted' ; 'Stop getting the fucking hump with him!' ; 'What other people think means fuck all!'	5 (14)
Letting Go	'Let go...Trust the divine plan' ; 'Surrender, this is a	3 (8)

	sacred space' ; 'You have to accept your death'	
Warning	'Don't go there!...You can still turn back!' 'They want you to kill someone...They want you to target someone!'	2 (6)
Insight into the World	'The answer is right in front of us...Everything already exists' or 'This is just one way of looking at things...It depends where you're looking'	1 (3)
Interaction & Behaviour		
<i>Active involvement</i>		10 (28)
Encompassing or Embracing		2 (6)
Opening portals		2 (6)
Possessing		2 (6)
Preparing		1 (3)
Flirting		1 (3)
Giving thanks		1 (3)
Pulling (subject) away		1 (3)
Marching on (subject)		1 (3)
<i>Passive activity</i>		19 (53)
Watching		9 (25)

Laughing or Smiling		7 (19)
Dancing		5 (14)
Jumping around / Busying		3 (8)
Pouring or 'Gardening'		3 (8)
Hovering		2 (6)
Spinning		2 (6)
Beautifying / Fixing		2 (6)
Wriggling / Crawling		2 (6)
Acting		1 (3)
Moving on tracks		1 (3)
<u>Exploring Other Worlds</u>		
<i>Breaking through the veil</i>	Subjects explicitly stating there being a barrier of some sort through which they had to pierce to 'breakthrough'	8 (22)
<i>Emergence into novel reality</i>	Subjects explicitly stating the fact they were no longer in 'this world' but elsewhere entirely	21 (58)
<i>Navigation through space</i>		11 (31)
Floating / Flying		8 (22)
Transporting / Travelling		2 (6)
Folded '460 degrees' or Dragged		1 (3)

Swallowed		1 (3)
Scene		
<i>Human worlds</i>		6 (17)
Street		3 (8)
Re-enacted surroundings	Some simulation of the immediate environment and people around the experient	2 (6)
Building / Structure (Non-sentient)		1 (3)
<i>Natural worlds</i>		10 (28)
Outer-space	e.g. black holes	6 (17)
Natural landscape		4 (11)
Vulva		1 (3)
<i>Artificial worlds</i>		6 (17)
Mechanism	e.g. 'Conveyor-belts'	2 (6)
Icicle / Waterfall	Digital in nature	1 (3)
Laboratory / Clinical space		1 (3)
<i>Children's worlds</i>		3 (8)
Playpen / Nursery		2 (6)
Circus-like / Children's book		1 (3)
<i>Nebulous worlds</i>		13 (36)
Lattice / Gridwork		9 (25)
'Tron-like' or 'Blueprint of Universe'		2 (6)
Dark space / Void-like		2 (6)

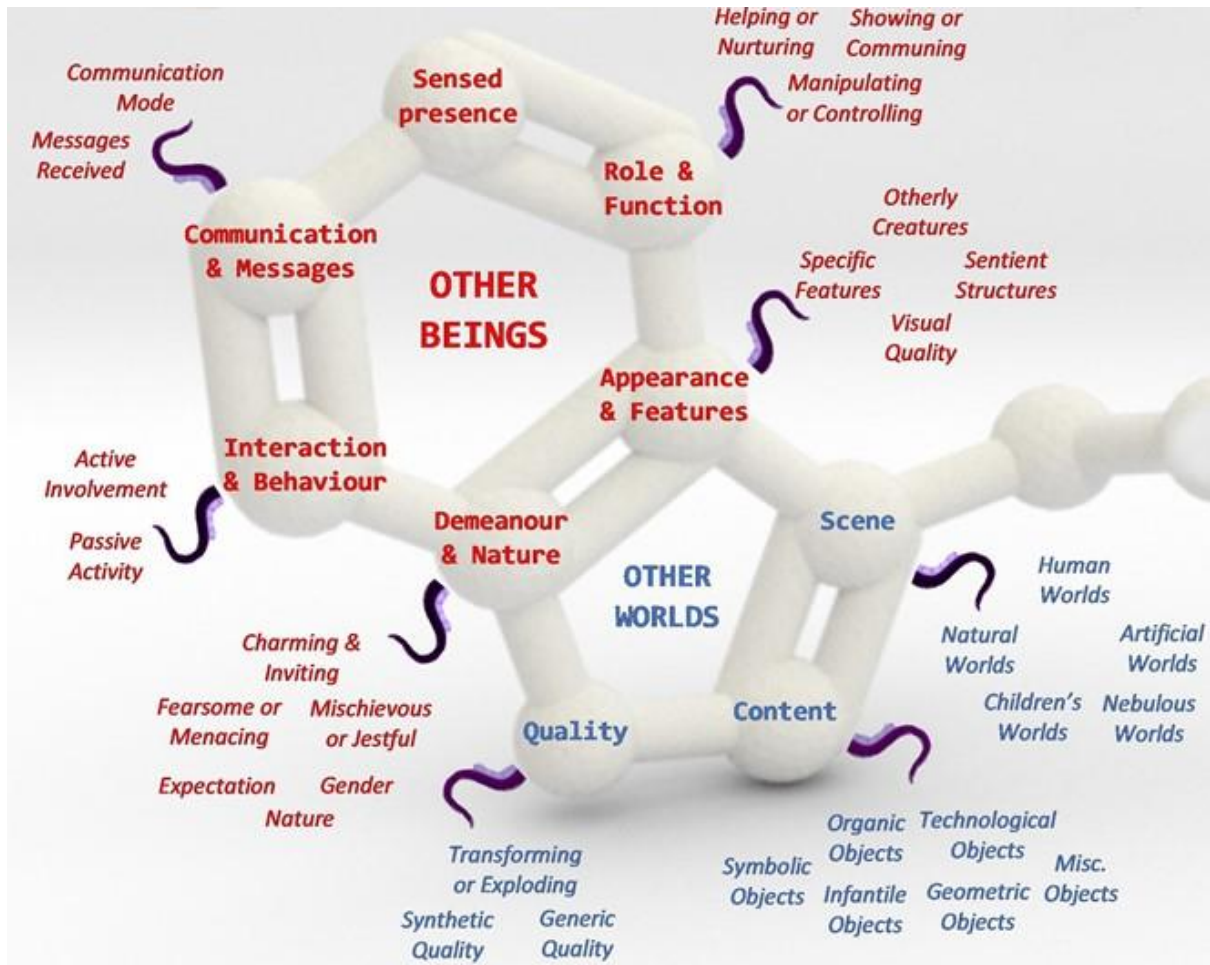
Light space		1 (3)
Ether / 'The fabric'		1 (3)
Contents		
<i>Organic objects</i>		16 (44)
Plants & Flowers		10 (28)
Cellular or Subcellular	e.g. DNA (organic)	4 (11)
Molecular or Subatomic		3 (8)
'Intra-Body Experience'	Akin to shamanic practice of viewing the condition of the body from the inside for diagnoses and healing (c.f. OBE)	1 (3)
The Elements		1 (3)
<i>Technological objects</i>		8 (22)
Mechanics & Devices		4 (11)
Satellites & Spacecraft		2 (8)
Medicine		2 (8)
Car		1 (3)
<i>Infantile objects</i>	e.g. Push-chairs	3 (8)
<i>Geometric objects</i>		16 (44)
Spherical shapes		7 (19)
Hyperdimensional structures	5/6 being hypercubes	6 (17)
Other polyhedrons		3 (8)
Islamic-like sacred geometry		2 (6)

Flower of life		1 (3)
Mandala		1 (3)
Maze		1 (3)
<i>Symbolic objects</i>		6 (17)
Symbols / Signs	Specific images which had obvious symbolic meaning, which may seem medicinal, religious or ambiguous	5 (14)
Ancient language / Hieroglyphs	Specific images looking like letters, scripts and pictograms of archaic civilisations	3 (8)
Matrix code	Classic strings of numbers and other symbols, 'Raining code' as seen in The Matrix trilogy	2 (6)
<i>Miscellaneous objects</i>		14 (39)
Serpentine or Cyclic		7 (19)
Small barrel / tube		2 (6)
Sweets		2 (6)
Ladder		1 (3)
'Magic mirror'		1 (3)
Bible-like book		1 (3)
Chalice		1 (3)
Antique bathtub		1 (3)

'Spikey, jangley' thing		1 (3)
Quality		
<i>Transforming or Exploding</i>		7 (19)
<i>Synthetic textures</i>		15 (42)
Cartoon-like or Animation		5 (14)
Organic-Mechanic		5 (14)
High-Definition		4 (11)
Holographic or Digital		3 (8)
Retro-game or Old		2 (6)
<i>Generic textures</i>		11 (31)
Very colourful		5 (14)
Fractal or Geometric		3 (8)
Fluid / Organic		2 (6)
Painted		2 (6)
Blurry		2 (6)
'Razzmatazz' / Garish		1 (3)
Wavey		1 (3)
Ornate		1 (3)
Jewelled		1 (3)
Dream-like		1 (3)
'Organised Chaos'		1 (3)

4.

Graphic of all super-ordinate and mid-level themes



5.

Indicative Questions of Semi-Structured Interview (with initial prompts)

- Please can you describe your DMT experience as best and fully as you can, and as chronologically as you can. Please use all your own words, and try to break down your experience into its detailed elements, while avoiding using terms and concepts from other people or popular culture

- What is the first thing you remember?

- How did your body feel during the experience?

How did your awareness of your body change?

- Did you see any geometric, fractal or entoptic patterns?

Where they colourful, or moving? What was their dimensionality?

- Where did you 'go' in your experience?

What did the scene look like?

- Did you have any encounters with other beings in your experience?

What did they look like? What was their approach toward you? Did they communicate with you? Did they interact with you?

- Did you receive any information, or have any particular insights or understanding?

- How was your sense of time affected during the experience?

How long did the experience seem to last? (Versus how long it *did* last)

- How pleasurable was the experience?

What other emotions did you have?

- What was your sense of self like?

In relation to the world around you?

- On a scale from 1-10 where 10 is the most intense and 1 is normal intensity of experience, how intense did your experience get?

Appendix B: Chapter IV

1.

Meta-narratives: Co-creative Insight into Heart and Cosmos

Juxtaposed to all previous discussion, the following themes pertain to a more interpretive function of participants' narratives; their reflections on, as opposed to the content of, the experience in itself.

Mind-manifestation

Given DMT as a "psychedelic", in the vast majority of cases, thirty, it was evident at some point that its *Mind-manifesting* nature – as is the meaning of the neologism – was being displayed. BB (35-39y, M, White British) is extremely articulate in giving voice to this very dream-like effect of how the psyche seems to generate imagery inspired by one's mental

and emotional substrates, that is, the 'set' (17) of their mind prior to the experience – in his case the percolation of the notion of his child:

“it didn't immediately feel like my son, it felt like someone in that role which fulfils that thing. So naturally my brain, just like a dream, puts a face to it...'And here's one I made earlier!' ...

this very, like I said, very strong sort of presence of this particular type of character, represents this particular type of thing to me – my son...

The reason I mentioned a dream, a dream-state, is because things the dream-state versus reality are kind of the opposite. So for example in reality, you see something immediately concrete and solid and definable, that over time affects you and changes your inner state, that ultimately ends up making you feel something. But in the *dream* and *psychedelic* state, it's the exact same things but in reverse, just in the opposite order. So you feel something incredibly strong which gives rise to associations, which ends up potentially forming a visual image. But that image isn't what it is, it's just what you come up with...it's like the word that best fits. So it wasn't my son – 'oh hey, hey Bean how's it going' – no, it was just wow, this form of love, that form of love, was just there, this type of relationship. Not even a person. Like I said, in the most abstract- in normal life you end up with feelings which are abstracted about something specific. And this started off in the complete abstract, so a form of love, which crystallised into – 'oh, familiar, yeah I know that...!'”

'Intentions' set by participants, or more commonly, 'personal actions' that they themselves were enacting within their experience (11), included, as per the former, SP (Trip 2) who “went into the experience basically saying, giving myself to the universe” going on to, indeed, experience a participation in the creation of the cosmos. As regards the in-trip functions of the psychonauts – explorers of psyche – most disclosed they were “just witnessing it”, serving as “only a visitor, an observer”, while BB, having explained his “sensed presence of pure love” as specifically played out by his son, elaborates that there was also “[an]other one, the sort of, its protector” as he himself “was filling that role as well, the...unconditional protective love”. One of the more purposeful and proactive participants, OR's (Trip 2; 25-29y, M, Brazilian) attempts to journey with and aid his struggling DMT partner were inspired by his Barquinha religious imperative:

“I felt like there was an indigenous guy with me who was strong... And there was a tone I needed to *Whoof*, you know this is the sound we make when we are with spirits in Barquinha, and I felt like *Whoof* I was helping him to clean some of these companies [i.e. spirits]... this happens sometimes when I’m working with Pretos Velhos, and disciplining souls

Interviewer: Disciplining souls?

Yeah, imagine in Brazil you see tricksters or souls like this, and I felt like when I tried to concentrate and put energy into separate... *wheat from the chaff*, like something like this... he was having a, from my interpretation, a bad trip. And then again, I started to try to connect with him...in Barquinha we would say the interpretation is there are some lost souls there, some materialistic point of view, some arrogant...companies... imagine you had a dense cargo, so I get him in, I take from you or from the other, I took from you and send [it] to another realm, you know...

I felt connected with him spiritually...I felt compassion for him... I feel like I have responsibilities to do what I have learnt... if I feel he’s in trouble, I’m trying to connect myself with light, and maybe if I may if it’s possible to help him... for me...it was like he was having a spiritual attack”

The following is comparable to much of the above, but specific in terms of the subjects’ deliberate employment of their attentional focus within, and its direct influence upon the experience – as contrasted to the, thus far, vastly passive experiences. This ‘co-creation’ dynamic is particularly of note, mimicking the level of control one has when commanding a ‘lucid dream’ (10). To begin with, all AZ, RS and LR mentioned, respectively, that “geometrical figures were multiplying and I could somehow manipulate them”, “the [Aztec] patters...sometime you can interact, and you can move them”, “I was trying to manipulate the visuals...and push them along”. HV (35-39y, F, Black British – Ghanaian-Egyptian descent) discusses something reminiscent of shamanic practices to engender her own physical healing by similar visionary manipulation:

“Like a whirlpool...a smoky whirlpool... So that’s why I was using the wands, to unwind it and unravel it because it needed unravelling... a whirlpool of sickness, so I was unravelling it,

unravelling it...then it just started becoming like a part of the atmosphere... it was something that was just clogged up and needed to be untangled, I was untangling it...

that was the bit when I was cleaning myself out... that's the bit I was like 'how come it's not in my leg?' I thought it was gonna be in my leg, but it was in my back – then it was OK"

Both RH's (Trip 1) and SH's amorphous environments, likened to a "building" with "rooms", responded to their mental effort in moving forward. For example:

"I have this mantra going, that whatever is there – 'Concentrate deeply, concentrate deeply'...and that's when all hell breaks loose, that's when it all fractured...loads of dimensions everywhere" (RH 1: 55-59y, M, Asian British – Indian descent)

Most illustrative of this participatory nature of the DMT reality, where concerted attention plays into experiential construction, includes AF's report – which like SH's, emphasises the function of *movement* as one engages with the world, and both comprising an annunciation of the *Cosmic Game* (the world as engineered to play and experiment with):

"And this was showing me there's just so many other ways of looking at things, if you put your attention. And again...this thing [multidimensional cube] was moving, because I was looking at them, wherever I was looking, putting my attention, it was *becoming*. I put my attention there and these things are ready to move, put my attention there and these things are ready to move. So these sensual females, they were like...'It depends where you're looking at things and how you're looking at things!' ...they were telling me that everything I put my attention on can start moving, everything I want is possible – I just have to put my focus into it, and the game will start. But I have to keep moving. Life exists in the movement, and everything moves" (AF: 40-44, F, White Italian)

Importantly, while AF's lesson in the power of attention seems exhibited by her hypercubic object, so is this replicated in BB's (35-39y, M, White British) description of his frenetic cube which:

"rotates, sort of spins, not slowly...almost as if it's trying to catch your attention, basically, as if it's trying to spin and add extra layers of colours and detail just to grab you, and in front of your eyes it does this. If you stop paying attention to it...it's off on the side. But when you look at it, it moulds in front of you. The act of looking at it, paying attention to it, *creates* it"

Ontological and Emotional breakthrough

Inter-spliced with the experiential narratives, the predominant focus of the interview, most subjects, twenty-seven cited here, would naturally voice their opinions on the ontological status of what they had just gone through, its consequences for their worldview, and the deep learning they would take away – thus all encompassed under *Ontological and Emotional breakthrough*. First, subjects' 'metaphysical beliefs' (18), evinced by the felt ramifications of the trip, were often profound, many of which asserting its hyper-real, that is *more real* than real, nature. MP states that although his scene, with which he felt "a merging of my body" in a "non-dual relationship", appeared "super holographic, very digital looking", it was also "hyper-real", elaborating that he enjoyed "Knowing you're immortal, that there's no death, knowing there's much more to reality than just the physical". Articulated by LR (25-29y, M, Chinese-Italian – Dual) again, the DMT space was "So real, so real. So very real. If anything, it was like, realer than real. Such a cliché", he eloquently builds the model that:

"this is my essence and this is the true form of all things, and everything that I am when I'm not paying attention to the true form of all things is kind of like, it's like *that's* the dream, that's the distraction from the reality, and *this* is the reality that I'm in"

RH (Trip 2) labours this idea yet again, saying it is "more real than real, I know it's a cliché, but just so fucking real!", and that typically there ensues a progression from "geometry and fractalization" toward ultra-vivid iconic scenery, or "very solid, well if it was a film, a very, very well-conceived film". Proclaiming upon return his "110%" credulity, "There is no question. Fuck me I am so, so convinced" he appeals to deeper versus farther worlds, that it may be "a quantum world we're going into". This sentiment of the inter-relevancies of "deep physics, metaphysics" and the DMT trip is shared by RS, claiming that the entoptics are "in this world, regardless of if we see them or not they're there...I really do think there's something to it with dark matter". Such ideas he develops slightly by "the idea of consciousness not generated by the brain, but antennas picking up certain frequencies – it's like the DMT tweaks the antenna a bit", which in turn, returning again, foreshadows RH's statement of a similar frequency that it's "Almost as if [the entities] are having a similar experience... I do often wonder – does DMT not only enable us to break up some sort of inhibiting thing of the mind, but...does it allow them to see into our experience too?"

In RH's third experience, revelations of such incorporation on the part of the entities (see *Active involvement*, possession), are first prefaced by him with – still yet re-incorporated into consensus reality – “Wow. It's like you're so definitely here aren't you [i.e. the entities].

Oh my God, you're definitely here”, He further narrates a vivid metaphysical model that:

“it's two levels, like the human inside of you, 'my brain' human side of you- ...The human side had some surprise and some shock at all of this. But there's a part of me that just knew it all...it knew what to do. It knew what to do! Oh God, I'm not gonna censor myself, it honestly feels like: It's a Soul that knows what to do out there, whereas the brain, it's kind of useful for putting it into words that makes sense down here, but it feels like the soul knows exactly what to do... Like it has another *life* even, like it has a *completely* other life. I often feel like it's simultaneously existent in another plane whilst I'm partly connected to it in this experience...

We're nothing like we think we are! It's just beyond man! [Laughter]

Interviewer: We're not who we think we are – in what way?

We think that we are solely in this material, 3D/4D world. But I'm absolutely convinced we're doing this all the time. These entities, they're right here!... I mean, I cannot be shaken from this conviction that it's completely real, it's really, really happening, right next to this existence, another realm, right here...

[These entities have] a huge desire to experience somehow, and that's why I was a bit baffled when I came out, why I'm not quite human – ...the universe wants to experience itself, and it gets better at it with DMT. It's not the universe, I wanna get detailed about this: It was these creatures, these entities wanted, really want to experience everything... Then I'm not convinced I wasn't one of them”

Seconding RH's imminence of this other world, ST adds, alongside its insight-imparting qualities, that it “seems to be a thing where I step into this realm, and this realm is always here, and I step into this realm and this is your lesson for today. It's an endless class, every time you come there's always a lesson”, again alluding to reminiscences of quantum physics, with his shifting hypercube constituting “a fundamental thing in reality...the Planck scale”. Words of conviction about the more intrinsic depth to these far out worlds are

similarly also oftentimes threaded with the suggestion of connection to, and implications for the nature of, one's Self, as just clearly explored by RH, as well as by ST in another elaborate explication of his hypercube as being, essentially, "me". In this vein, OR (Trip 1) also remarks that "it's so incredible how the spaces inside me actually gain another kind of space. It's like you can actually, *Ooh*, open this thin part of reality and fill that with images...and consciousness". Again, OR brings up the repeated framework that, "It was like I was channelling to that frequency and that's what was happening on that frequency", and when asked as to the felt ontology of his "Preto Velho" spirit guide, he echoes this self-other consonance and dissonance:

"I would say another consciousness, separate to me. Imagine, actually it's the truth, but imagine my thoughts are in a wave, but when I feel this presence, I can realise the *shift* of these waves. So it's like even if that *is* me, I realise it's another part of me that thinks and realises and sees reality in a different way to me. Like I can actually be like, what I understand as [OR] thinks this way, and these other thoughts, I can have this feeling of I agree with you, but somehow I feel it's not me"

The reality-status of the entities is discussed along very similar lines by JA (35-39y, M, White British), again in the form of spirit guides, but more assuredly other:

"It's happened too many times...I feel like I'm in dialogue with something *outside* of myself because I'm being told things I just don't know... I'm given teachings or understandings of things I don't think I could come up with myself. And the dialogue is with such a different quality to ones I have with myself as well"

The cosmic wool as constitutively pulled over our everyday eyes, and the scales falling from them upon DMT intoxication – with very "real world" repercussions – is further championed by MS (55-59y, F, Mixed British – Iraqi-Italian descent):

"when I had my eyes opened before and today, that's when I felt the connection with everything, the breakdown of what you see is not what is real... it's just a feeling of mine...just how we perceive everything so wrong really, I suppose. And with that, it's showing you what *really* is there, sort of thing. Bizarre. Very bizarre..."

It's almost like we really live in an illusion in this world of ours, and people need to wake up and believe in other shit!... You know, for the sake of the- *humanity*, not the planet, because the planet will survive because the planet knows what it's doing"

The unmitigatedly extant, as well as paradoxically estranged and imminently embracing, nature of the DMT realm is again reaffirmed by RV (40-44y, M, White British):

"when I was presented with that space there wasn't even, there wasn't even the tiniest sliver of doubt as to its ultimate reality, as to the fact that somehow, somehow it exists, you know within, beyond, contains you know, this world"

Soon after inciting "the truth of this and to [that] reality" and his desire of "bringing that truth to humanity", RV then provides a development, more a profound soliloquy than participant response, of this matter of breakthrough epiphanies of such sublimely real spiritual realms against the backdrop of comfortable illusion, and human beings' burden of will upon their revelation:

"it's so disorientating that you almost don't- you know there's part of me that, a bit like in the Matrix, I'm always- I almost feel not entirely right about taking people out of the Matrix unless they're absolutely called to it, you know what I mean? Like should I give my wife the opportunity to see this? I don't know, not unless she's absolutely called to it, because it's so disorientating. Perhaps it's better just to *live* in the Matrix, and try to find Love and be Love, find humility and be humility, and try and live, try and be everything you can, without this extraordinary shamanic experience, which is *so* real, you know. Everything, it is *so* real, you know. Every religious, every attempt at being spiritual or religious, every attempt at being spiritual or religious is some attempt to connect with this. However misguided the religion, however- there's an attempt to try and wake us up to this extraordinary thing, and truth"

In a crucial turn, in terms of illustratively juxtaposing participants' reflexive ontologies, while RV evokes vivid parallels between the *Matrix* saga and his own gnostic deprogramming, BW here refers to his last DMT experience as very similar – in which he viewed his world and loved ones as composed of computer code – yet, his current trip in fact reversed such beliefs in some celestial simulation:

“I came out of that last [DMT trip] for weeks still mildly psychotic, it lasted for weeks and we talked about it, ‘the Matrix’. Like is there a matrix, are we- ?

Interviewer: How do you feel about it now?

I don’t feel it at all, not at all, no hint of that at all. No hint of ‘I’ve glimpsed what the world is really like!’ [Last time] I came out of it like I believed I glimpse the true nature of reality. What I just saw [today] was not the true nature of reality, *this* [consensus world] is the true nature of reality

Interviewer: And how does that make you feel about your previous DMT matrix experience?

In some ways relieved, and in some ways disappointed! Disappointed that it hasn’t shifted me existentially like the last one did. I feel frighteningly, boringly *not* existentially altered by it. It was a mind-blowing *drug* experience. But I came out of the last one talking for weeks about ‘is it real or not!?’ , and now I just know it was a drug experience”

As firmly evidenced, DMT’s baffling world necessarily calls one to question the ultimate nature of things, confronted with its deeply sensed reality despite seeming so, apparently, other, and starkly unlike what one is accustomed to in waking life. This ‘death by astonishment’, as paraphrased from the DMT promulgator, Terence McKenna, resounds with many participants’ comments already on the sheer intensity of the trip, but is further explored here around the ‘ontological shock’ (12) by the deconstruction of their prior world-models.

Both GR and TC echo one another, the former exclaiming, “it just kind of exploded into something... everything was like completely shifted into another way of interpreting reality”, and the latter, that “I could feel and see all my current issues kind of wrapped, and being completely shaken and... What I think what is reality all of a sudden got completely questioned”. The inner structures maintaining the daily rhythms are disintegrated, as in DD’s (40-44y, M, White British) words :

“I was like ‘I’m fucking up for this’ – I found that made it definitely easier for me to transition- but that *shredding* of perception...

Interviewer: Like you were saying before the trip with me, that switch of consciousness?

Yeah, yeah exactly, It's almost like the inner working of the brain that has to deal with linear time and your life on a day to day basis, going *Vrrrrrr* you know, *Ssshhtttff* like Dorothy [in the tornado]!"

Referencing his three trips, a part of each of them involving sensations of dying, usually in a "limbo-land", RH reiterates this unprecedented ontoseismic calamity:

"And the terror... it's more to do with the fact that reality is just so, broken, it's gone. Where I am in that waiting room is just so not anything I've ever experienced" (RH 1: 55-59y, M, Asian British – Indian descent)

"I've heard myself saying that in the trips before, just Wow or Fuck or you know, just trying to get my head around the extraordinariness of it

Interviewer: Did you know what *anything* was when you felt like you were dying?

No. This time definitely not, no... in the fracturedness I know absolutely nothing. That was a terrifying one...this one I just did, terrifying. God, I maybe thought I'd broken reality" (RH 2)

"Can you describe [the entities]?"

Oh My God, no! Fuck it! It's just too mind-blowing. It's kind of not fair... To explain it was extraordinarily difficult...it just seemed so far removed from anything – even though I can now tell you that they're boxes" (RH 3)

ST (35-39y, M, Nigerian) paints his hypercubic configuration in a symbolic light, where any attempt by his brain to predict its beguiling activity, an extension of his own mind, was futile – which is an insightful representation of life itself:

"it's saying, 'Imagine this [cube] represents you'...such that whatever is happening to it I am feeling... So it seems my set, so my expectation of what the experience should be, was totally blown out of the water by what I was seeing, and what I was seeing represented something that would be painful to that set of expectations...

And not just expect you'll understand the patterns... you're looking at patterns, your brain predicts what this thing's supposed to do next...but this is showing you 'Look mate, you cannot predict because this one has multidimensional directions it can go to that you can't

even fathom. Like ‘Oh that's possible!?’...you think it's just up and down, and it goes inside out and sideways at the same time, and you're like How the fuck, what!!?...

For me it just seemed...being always perplexed by what actually happens in life to me...I can relate it to, the way I expect things to go compared to the way they appear. Things can go anywhere man, from zero, there's nothing to expect because look at what makes them up – There's no predictable thing here, so the only predictable thing is this chaos!”

To finally reiterate this simultaneity of the experience's interstellar yet deeply inter-fused quality, in revisiting FF's “phenomenally alien, but familiar” world – although he admits that “except for my previous DMT experiences, there is *nothing* comparable” to that “quite terrifying, mind-blowing environment” – he still reinstates that “it's somewhere deep down you know it, it's familiar”.

Distinguished from noetic episodes of sudden comprehensions of everything, or messages communicated by entities, ‘insights’ or ‘breakthroughs’ (14) both in a more metaphysical and personal sense were equally profound. First, a revelation of “the love I already have” was already discussed by BB – a sudden, hilarious and salutatory realisation granted to him as part of the “*You Dick! moment*” of his ‘cosmic giggle’, which he completes with a modest “I've kind of got something really positive from the experience”. RV's more severe, aforementioned cosmic disclosure of “the truth...of that reality”, paralleled to “taking people out of the Matrix”, was also adorned with such meditations on love – that “perhaps it's better just to live in the Matrix, and try to find Love and be Love, find humility and be humility”, and a conviction in the discernment of the Buddhist aspiration toward a “very special kind of non-attachment which is about the heart... this unconditional love for all things”.

LR indicates a “reconfirming, just like, reminders of what I already know, this ancient knowledge within myself”, that is, an oasis of original knowledge available, but often inaccessible, to mankind – and reaccessible during such experiences, agreed by RS (25-29y, M, Black British – African descent):

“we've definitely lost something, as humanity, we've forgotten something – we're definitely coming back to something, but we've definitely lost something of this old, deep realm

Interviewer: And you think this realm is as it appears to be, like full of other sentient beings?

Yeah, I think if we can communicate better with them, I think it's really about us listening, and a big part of it is humans have forgotten how to listen to the world...we don't realise that we're part of nature and everything we make is also part of nature. It's because of that problem, the separation, that things [are] out of harmony. So yeah, I've had presences being like this *symbiosis* before – we need to work with what else is here”

Resonating with this understanding of an urgency for a re-enchantment with the natural world (also touched on by MS, earlier), is AV's statement that she “felt the responsibility that we have as human beings, to hold the space for each other, to look after the planet”. A different epiphany as to the natural order of things, for LG (30-34y, M, Mixed British – Sri Lankan-German descent), was instigated by a dramatic plunge into a harrowing death scene, though embedded with lessons in gratitude:

“I'd had a fucking heart attack, and...everything's been going so well between her and I, and I was like 'Fuck this is it, she's gonna be devastated'. But then...I was going 'No, No, but this is the nature of reality'. This feeling, that this is the nature of reality, and it's not always cushy, you don't know what's the round the corner, so whatever is going on at any point!...

all these thoughts came in like 'This is the nature of how energy works – it's gonna revert back on itself at some point'... how everything is transient, you go through these phases that's neither one or the other, and death is just part of that process... It's all good for a period of time, then you just get slammed with something fucking heavy, which is the way it is. You kind of forget about it when you're caught into whatever cycle is going on”

In a much more reified exemplar of learning via the experience, ST outlines the intricate interaction he has with his hypercube-*cum*-himself, that he likens here, aptly, to a “brain-game that you play”, as if some psychospiritual rubix cube:

“So it's like a lesson...and it teaches you... [it] shows you a different state, and you play to different stages and different difficulty levels... it would show me different levels of that which would automatically put me physically in a certain state which is new to me, because I'm a newbie in this game, at 'high difficulty' level...”

it's like a new language: *Associate this feeling with this pattern of movement...* the real thing that's the message – You were taught with 3 colours, there's like 12 different colours and they were moving before in 2 dimensions, but now they're moving in all different dimensions possible which is probably 11! So it's like a programming as well, like my physical responses have been programmed to go with whatever pattern was displayed...this 'high grade' pattern"

He continues that, "this seemed like something I was teaching myself or something, or those beings were", and alongside the cube's (aforementioned) association with tripping over his own breath, upon letting go he realises what meaning to ultimately glean:

"Ok surrender to this' ... surrender to whatever's happening, just to breathe and let it happen by itself... breathe as you know how to breathe, you know, which is just live as you know how to live... Just live, live!..."

So that generally speaks to me in saying, I can't have expectations about people, or things, or situations, because these things must have a life of their own so to speak... If you think about breathing too much, like that demonstrated, you could die!... I tend to overthink things... Almost like you wanna be perfect before you make a move, like *bust* a move, everyone's allowed to make mistakes, you don't have to be an expert, that's how you learn... Breathing is basic, and we take it for granted even though it can be a problem, so why don't I extend that to other things that I do – I can just do them, without having to check how I'm standing morally or this or that ticking all the boxes before I make a move, you know"

It's particularly noteworthy that ST's sentiments of relegations of over-anxious concerns or pressures to be morally immaculate, and protestations to simply *live*, as also potentially conveyed by beings, are all highly reminiscent of both SH and AF's insights throughout their 'cosmic game' encounters (see **Encounters**, *Communication*) – during which the latter also witnessed a colourful, shifting "multidimensional cube".

2.

Table of all super-ordinate, mid-level and subthemes

Encounter with the Self

Clarificatory notes

No.
Interviews
/36 (%)

<u>Onset</u>		
<i>Sensory</i>		14 (39)
Submergence		9 (25)
Geometry or Patterns (Onset)		6 (17)
<i>Emotion & Body</i>		18 (40)
Laboured breathing		7 (19)
Terror or Panic		6 (17)
'The rush'		5 (14)
Anxiety or Fear (Onset)		4 (11)
Pain / Torture (Onset)		2 (6)
Trapped / Powerless		1 (3)
Body expanding / melting		1 (3)
<i>Space-time shifts</i>		10 (28)
Time dilation (Onset)		6 (17)
Reality breaking down (Open eye; Onset)		4 (11)
Immediately elsewhere		4 (11)

<u>Bodily</u>		
<i>Pleasurable</i>		10 (28)
Ecstasy		4 (11)
Pain relief		2 (6)
Fusion (with partner)		2 (6)
Rooted		1 (3)
Stretching urge		1 (3)
Warmth		1 (3)
Post-orgasmic state		1 (3)
<i>Neutral / Both</i>		8 (22)
Religious hand-signs		3 (8)
Vibrating or (Subjective) Convulsion		3 (8)
'Phytanthropy'	Subject's transformation into a tree	1 (3)
Falling sensation		1 (3)
<i>Uncomfortable</i>		9 (25)
Heaviness		1 (3)
Paralysis (Subjective)		1 (3)
Sensitivity		1 (3)
<u>Emotional</u>		
<i>Positive</i>		34 (94)
Peace / Pleasantness		16 (44)

Profundity & Beauty		14 (39)
Familiarity		11 (31)
Loving or Connected		10 (28)
Gratefulness		8 (22)
Humour & Hilarity		7 (19)
Healing		5 (14)
Release or Relief		4 (11)
Humility		3 (8)
Gentleness		2 (6)
Womb-like		1 (3)
<i>Neither / Both</i>		21 (58)
Extreme intensity, or Overwhelm		21 (58)
Letting go / Detachment		3 (8)
Wash of emotion		2 (6)
Ambivalence		1 (3)
Infantile regression	Clinging to, and biting their present partner, in a foetal-like position to feel safe	1 (3)
Disappointment		1 (3)
<i>Challenging</i>		7 (19)
Anxiety or Fear (During)		3 (8)
Confusion		2 (6)
Fear of letting go		1 (3)

Grief (from own death)		1 (3)
Guilt		1 (3)
Pain / Torture (During)		1 (3)
Personal struggles		1 (3)
Traumatic re-experience		1 (3)
<u>Sensorial</u>		
<i>Open-eye</i>		11 (31)
Other open-eye visuals		7 (19)
Reality breaking down or Pixilation (During)		3 (8)
Clairvoyant-like		2 (6)
Energy flow		1 (3)
Skulls		1 (3)
Depth-perception		1 (3)
<i>Visual</i>		27 (75)
Geometry (During)		16 (44)
Colourfulness		13 (36)
Flux		13 (36)
Fractals		11 (31)
Hyperdimensionality		8 (22)
<i>Cross-modal & Other</i>		14 (39)
Synaesthesia	Audio-visual (3)	10 (28)

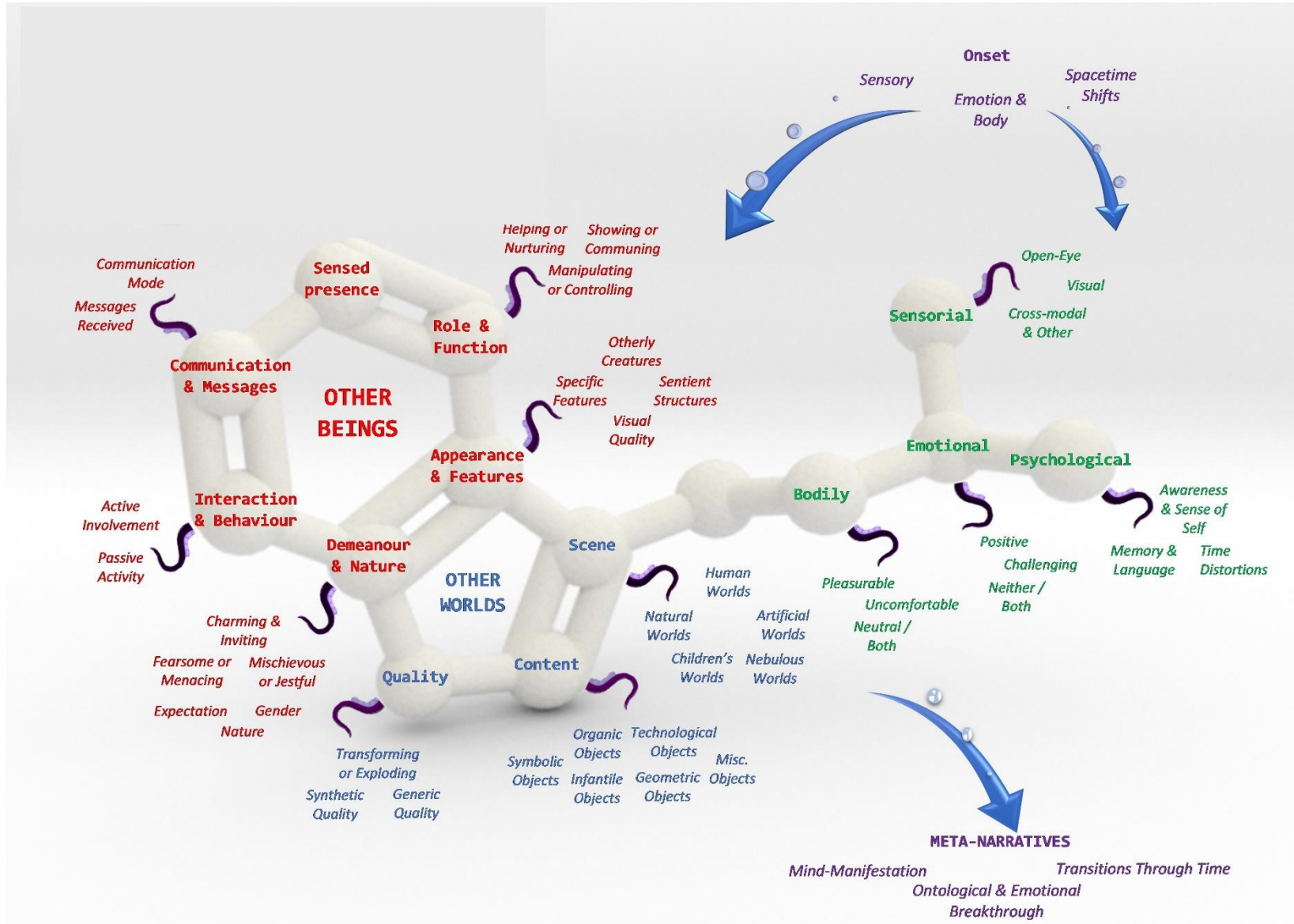
	Somatic-visual (3) Audio-somatic (1) Somatic-visual-audio (1) Visual-cognitive-affective (1) Somatic-visual-cognitive-affective (1)	
Sound (During)	e.g. Tones, Glitches	4 (11)
Sensitivity		3 (8)
Audio slowing		1 (3)
Tactile	e.g. Walked on	1 (3)
<u>Psychological</u>		
<i>Memory & Language</i>		31 (86)
Difficulty expressing / Recourse to metaphor		19 (53)
Temporary memory loss (within experience)	Inability to remember prior condition of 'being in an experiment, to answer 'intensity rating' questions	15 (42)
Partial recall loss (after experience)		12 (33)
Looping & Intrusive thought		4 (11)
'Schizophrenia'-like	Involving confusion between thoughts and speech, and sense of losing one's mind	1 (3)

<i>Awareness & Sense of Self</i>		18 (50)
Aware of surroundings		9 (25)
Unaware of surroundings		8 (22)
Lucidity / Ego preservation		5 (14)
Clear mind		1 (3)
Intuition		1 (3)
<i>Time distortions</i>		13 (36)
Time dilation (During)		5 (14)
Time contraction		4 (11)
Other distortions		3 (8)
<u>Meta-Narratives</u>		
<i>Mind-Manifestation</i>		30 (83)
Influence of 'Set'		17 (47)
Influence of 'Setting'		16 (44)
Personal actions & Intention		11 (31)
Co-creation / Lucid dream-like		10 (28)
<i>Ontological and Emotional breakthrough</i>		27 (75)
Metaphysical beliefs		18 (50)
Insight / Breakthrough		14 (39)
Ontological shock / 'Death by astonishment'	Ontoseismic, or 'world-shattering', experience, given experience's baffling	12 (33)

	nature or disassembling of all prior conceptions	
<i>Transitions through time</i>		20 (56)
Internal dynamics		13 (36)
Repeated content	Experienced in previous DMT trips also (May be due to state-dependent memory)	11 (31)
Novel content		6 (17)

3.

Graphic of all super-ordinate and mid-level themes – including those of *Encounter with the Other* (Chapter 3)



4.

Indicative Questions of Semi-Structured Interview (with initial prompts)

- Please can you describe your DMT experience as best and fully as you can, and as chronologically as you can. Please use all your own words, and try to break down your experience into its detailed elements, while avoiding using terms and concepts from other people or popular culture

- What is the first thing you remember?

- How did your body feel during the experience?

How did your awareness of your body change?

- Did you see any geometric, fractal or entoptic patterns?

Where they colourful, or moving? What was their dimensionality?

- Where did you 'go' in your experience?

What did the scene look like?

- Did you have any encounters with other beings in your experience?

What did they look like? What was their approach toward you? Did they communicate with you? Did they interact with you?

- Did you receive any information, or have any particular insights or understanding?

- How was your sense of time affected during the experience?

How long did the experience seem to last? (Versus how long it *did* last)

- How pleasurable was the experience?

What other emotions did you have?

- What was your sense of self like?

In relation to the world around you?

- On a scale from 1-10 where 10 is the most intense and 1 is normal intensity of experience, how intense did your experience get?

Appendix C: Chapter V

1.

Thematic Analysis of the DMT Experience – The Mystical Experience

All participants articulated at least one theme subsumed by the category 'The Mystical Experience'. These were not deductively predicated on the 7 dimensions of the classical mystical experience (as schematised by Barrett et al, 2015), but through inductive analyses the final themes did align with these and the names were kept consistent. The two themes of 'paradoxicality' and 'entheogenesis', however, are not dimensions of said schema of the experience.

Ego Dissolution

Eleven interviews of the 36 reflected participants' experiences of 'ego dissolution'. Across responses, they described a disintegration of their sense of self, going from a sense of individual persona to that of a perseveration of conscious awareness yet lacking subjective identity. GR (25-29y, M, White Romanian) expressed:

"I was just going, my sense of self dissipated, I just did not exist anymore... It was like everything literally was just...an infinite universe of raw information"

When asked if he encountered a presence with him, he responded *"But I mean myself wasn't there in the first place, there was no me or myself"* - implying the necessity of the integrity of one's own sense of self for the mediation of the sense of another's.

Although the participants described their experience of ego dissolution within a narrative of "death," such as AN's description of *"it was like I'd died,"* this death of ego wasn't associated with annihilation into unconscious oblivion but rather the ablation of the egoic structure with continued expanded awareness.

There appeared to be a discrepancy in responses as to whether ego dissolution was enjoyable. Whereas in RH's case he elicits the fearfulness of such experience, *"Powerlessness, terrible powerlessness... The dying bit is the worst bit of not knowing,"* JB revelled in his selflessness shedding *"tears of beaut[y]"* and resolved his experience, *"still saying 'I love everything'"*.

Unity

Themes of unitivity transpired across nine interviews, where participants painted imagery of the boundaries to the individual self dissipating and a *"merging"* of self into their surroundings, or indeed, all that is. As recounted by RS (25-29y, M, Black British – African descent):

“The beings, the geometry, they’re all just interrelated, even myself as I experience it – I move my body and it moves as well. The boundaries of self, the bounds of self and other is very thin”

In some responses, such descriptions of fusion were applied with respect to the entities encountered during the DMT experience. For example, *“It felt like [the entity] had his own autonomy but he also felt like a part of me, because at that point I felt like I was part of everything”* (RS), and *“I didn’t feel like there was a separate entity, other than the mass entity. I felt more like I was everything rather than that separation”* (AN).

For the most part, the experiences of unity reflected positive feelings, evoking a felt sense of *“belonging”, “universal connection”, and “love.”*

Transcendence of Time & Space

A perception of the escape from the structures of both space and time appeared as another fundamental theme across eight participants’ experiences. In some instances the passage of time was void entirely, leading to an impossibility of its quantification:

“It was timeless within there... I didn’t really have any concept of self...let alone the concept of timeframe... And now I’m looking back it’s easy to say, well it just felt like a few minutes” (FF)

In other instances the flow of time’s arrow no longer seemed to move in a linear manner, where DD (40-44y, M, White British) articulates an especially ineffable state of the novel complexification of his temporal experience - which was intimately tied to the appearance of a hyperdimensional cube.

“...it felt like there were all sorts of possibilities that were coming in, converging... It was like all levels of this linear time we’re on now- ...everything that made sense just totally skewed and all mixed together and time and everything all converged, like has this been 10 years or has it been 2 seconds!?”

Multifaceted, all possibilities of, like after this experiment, before this experiment, during the experiment, 50 years down the line, but like all happening at the same time...instantaneously... those levels of perception that just completely fracture away and twist and turn...

And all the lines of time where converging in a heartbeat though, in a heartbeat, and you let that go... like I was spiralling into this cuboid that was drawing me...and it kind of splintered, and I don't know if it was 2D or 3D... I wasn't thinking it at the time- but I'm thinking, yes it could have been different timelines"

The experience of space during DMT also became ineffable and radically removed from ordinary perception, where *RH* (55-59y, M, Asian British – Indian descent) below mirrors *DD* above in the paradoxical explosion not of time but of space.

"There was something about there not being a direction. At first it alarmed me, because I was thinking 'Concentrate deeper', except there wasn't any deeper, that was the thing. It was like everything was going back that way, down up. And not just that, every single part of it was fractalizing, there was nothing to hold onto, nothing I could grip, or do anything. Everything was just expanding from every point, no end to it"

One participant, *SP*, alluded to the void-like nature of the space, when he responded after being asked if he found himself somewhere else, "more like nowhere".

Finally, in referring to the idea that one "understand[s] and feel[s] the experience of multidirectional time in a trip", *RS* evokes the peculiar and profound concept that, though "it doesn't make sense...it's also like you never left as well. Because it's like I came here, and you never really left, you're still kind of there"

Noetic Experience

Eight participants also reported states of insight during their DMT experiences encompassing a certain noetic quality. Many of the reports described the reality

experienced as being “*more real*” or “*realer*” than everyday waking consciousness, suggesting a perceived capacity to connect with the base of being, or as *ML* poignantly frames it, “*the bigger picture. The whole purpose of it all. The whole puzzle of life*”.

This distinction between a dreamlike, everyday reality and the true nature of reality on DMT was, again, vividly encapsulated in *LR*'s (25-29y, M, Chinese-Italian – Dual) report:

“...like this is my essence and this is the true form of all things and everything that I am when I'm not paying attention to the true form of all things is kind of like, its like that's the dream, that's the distraction from the reality, and this is the reality that I'm in”

For some, this noesis was associated with revelations of a specific metaphysical nature, such as *MP* disclosing the feeling of “*Knowing you're immortal, but there's no death, knowing there's much more to reality than just the physical*”.

Interestingly, although the DMT offered a sense of connecting to greater fundamental truths, two of the participants questioned the value of entering this “*knowing*” against the backdrop of the normality, yet specialness, of quotidian life. Using the 1999 film “*The Matrix*” to tease apart this important tension, and to gesture toward a cautioning against the direct encounter with the ‘mysteries’, *RV* (40-44y, M, White British), finally, very evocatively described:

*“I almost feel not entirely right about taking people out of the Matrix unless they're absolutely called to it, you know what I mean? Like should I give my wife the opportunity to see this? I don't know, not unless she's absolutely called to it, because it's so disorientating. Perhaps it's better just to live in the Matrix, and try to find love and be love, find humility and be humility, and try and live, try and be everything you can, without this extraordinary shamanic experience, which is so real you know...
...every attempt at being spiritual or religious...is some attempt to connect with this. However misguided the religion- there's an attempt to try and wake us up to this*

extraordinary thing, and truth... we talk about spirituality, this kind of nebulous mystery, this unknowable thing that- and for most people it remains that, this kind of hunch you feel inside yourself, there's an intuition of something beyond, but to just be (smacking noise) immersed in the absolute Is-ness of it...!"

Deeply Positive Mood

Many participants, eleven precisely, expressly articulated having deeply positive experiences whilst on DMT.

With descriptions of feeling “*completely cocooned*”, “*womb*”-like (AN) an “*absence of fear*”, and a “*pure loving experience*” (SP) during their journeys, the DMT seemingly promoted a deep sense of safety in participants.

In the case of FF (45-49y, M, White British), this state of profound serenity allowed him to feel intense gratitude for the honour of being able to partake in a realm well beyond the normal state of consciousness.

“...the second I calm down...I'm like 'Oh it's here', and you feel safe to observe and it's blissful, I'm blissed. I feel blessed that I've had this opportunity to go there again... I was just spectating this phenomenally alien environment I felt privileged to be seeing, I felt blissed by it all”

Catharsis, that is, a process of freeing from oppressive emotional experience, also appeared to positively characterise many subjects' reports, with AF affirming that “*it was very liberating*”, SH similarly stating “*such a release from everything...I couldn't stop laughing...for a really long time*” in the midst of an inexpressibly beautiful world, reiterating “*I feel amazing now...on top of the world! Like I'm made of this gold light, that's how it feels*”, and JR offering that after “*processing the energies that are difficult to release... it feels like you're in alignment with everything*”

Saliently, all of AN, SP and AF's experiences of positive mood and catharsis were dovetailed with sensations of pure being (see Ego dissolution, above), such as “*this feeling of being aware of my own consciousness*”, or statements that “*I had that sensation of just existing*”.

Sense of Sacredness

Two participants offered the idea of sacredness – a feeling of sacrosanctity which touched them deeply. *JB* formulated it as a “pretty mystical- pretty religious experience, I think you can describe it as. Melting into the universe... A Oneness, a wholeness, a universal connection”, while *AV* (45-49y, F, Brazilian) alludes to the sensorial beauty and quiescence of her safe containment:

“I tried to find a place where I could just be in this place in silence... The sound of the water was coming down, the crisp sound of burning wood, was trying to keep me in this sacred place. And I was thinking, all this sacredness...in the middle of a ceremony... I was telling myself, ‘you are in a sacred space, just be’”

Ineffability

Another theme most endorsed by the experiencers, in eleven instances, was the conviction of the inconceivability to parse the exact nature of their experience into language. *GR* (25-29y, M, White Romanian) vividly informs us that he could barely conceptualise it as the experience unfolded, asserting that:

“I wasn’t aware of what I was seeing, it was something beyond my capacity to imagine, process, intellectualise, understand or anything like that. So beyond anything of that sort”

ST (35-39y, M, Nigerian) articulates the following, in valiant attempts to formulate into words his experience with an object, seemingly not of the dimensionality one is typically used to, and its confounding manoeuvres:

“[Because] you’re looking at patterns, your brain predicts what this thing’s supposed to do next, because of what it looks like it’s been doing. But this is showing you ‘Look mate, you cannot predict because this one has multidimensional directions it can go to that you can’t even fathom’. Like ‘Oh that’s possible!?’... You think it’s just up and down, and it goes inside out and sideways at the same time, and you’re like ‘How the fuck, what!?!?... did one line just-“ I can’t describe it...”

...there seems to be a dance kind of thing. It was synchronous as well as chaotic if that makes any sense. The chaos seems to be organised, does that make sense? If you're looking at what makes something up and it's chaos, but on a large scale it's beautiful and almost synchronous- that's the only word to describe that sort of thing... It's just too many words"

Paradoxicality

Not unlike the above, six participants gave a sense of parts of their DMT journeys being entirely impossible, yet cannot deny their experience of it – often capturing a reconciliation of what would normally be necessarily diametrically opposite. Especially akin to ST's above description, JM (35-39y, M, White British – Scottish) also describes logical incongruence to the visuality of what he witnessed:

"A combination of 2 and 3-D... At all kind of angles, indiscriminate placement, everything made sense wherever it was, even though it wouldn't make sense in a normal situation. It didn't matter if things were close, far or up, down, it all made sense either way"

RH's personal paradox, however, pivoted around his encounter with an entity with which he had an ambivalence regarding his separateness – or not – to it:

"This is what I'm trying to get my head around...we were kind of one thing, yet I realise there was a kind of separation, because I could reach to it..."

Interviewer: So later on when you suddenly realised you're yourself, but it's a different self to the ego you have now, as you associated yourself with this other entity?

Tough one... I think I was pretty much me again... it kind of makes sense and it doesn't make sense. Perhaps it isn't quite me actually, I don't know"

Entheogenesis

Finally, in three interviews the concept of the experience leading to a personal identification with God – a feeling not simply being at one, but the very same as, this ultimate principle –

was communicated. 'Entheogen', denoting the generation of the divine within, SP's (35-39, M, White British) second experience involved "a God-like feeling to it, in a sense,... I guess there wasn't anything else, as the point was there not being anything else apart from me". In his first journey, he elaborates on a sensation of participating in the creative function of divinity, as well as the challenge of avoiding the ego inflation that one may be in danger of after such a transfiguration, which was echoed by JB by referring to "a 'Jesus' sort of feel, an enlightened ego thing. You feel like, Wow, I'm so special... Then this kind of laughing realisation...and how absurd it sounds to yourself:

"It just felt like being, like, God, [or] a God... I was able to, sort of, to encompass that feeling of being everything...

It just felt so amazing, like Oh My God! Its like I've just like, like I've just farted out the universe or something...

...when I was taking LSD, [my partner and I] referred to it as the messiah complex, I assumed that's what everyone gets... When you start realising this idea that we're all potentially Gods and we all create our own...reality...

It reminded me of being slightly chosen in the sense that... it was a lovely experience of being a true king or leader or whatever, the most powerful ones who would be- Anyone can be that person... that feeling of being very special, but...without ego...

It just felt like there was some part of being intrinsically involved with the, sort of, flowing or development of consciousness...

So time distortions is like witnessing the creation of the universe, for me I guess I feel special that I was able to witness that... I guess it was like being born. Being born and quickly gaining consciousness, that's what it felt like"

2.

NDE Scale applied to DMT Field study, Laboratory study participants and Classical NDEs

Figure 1.

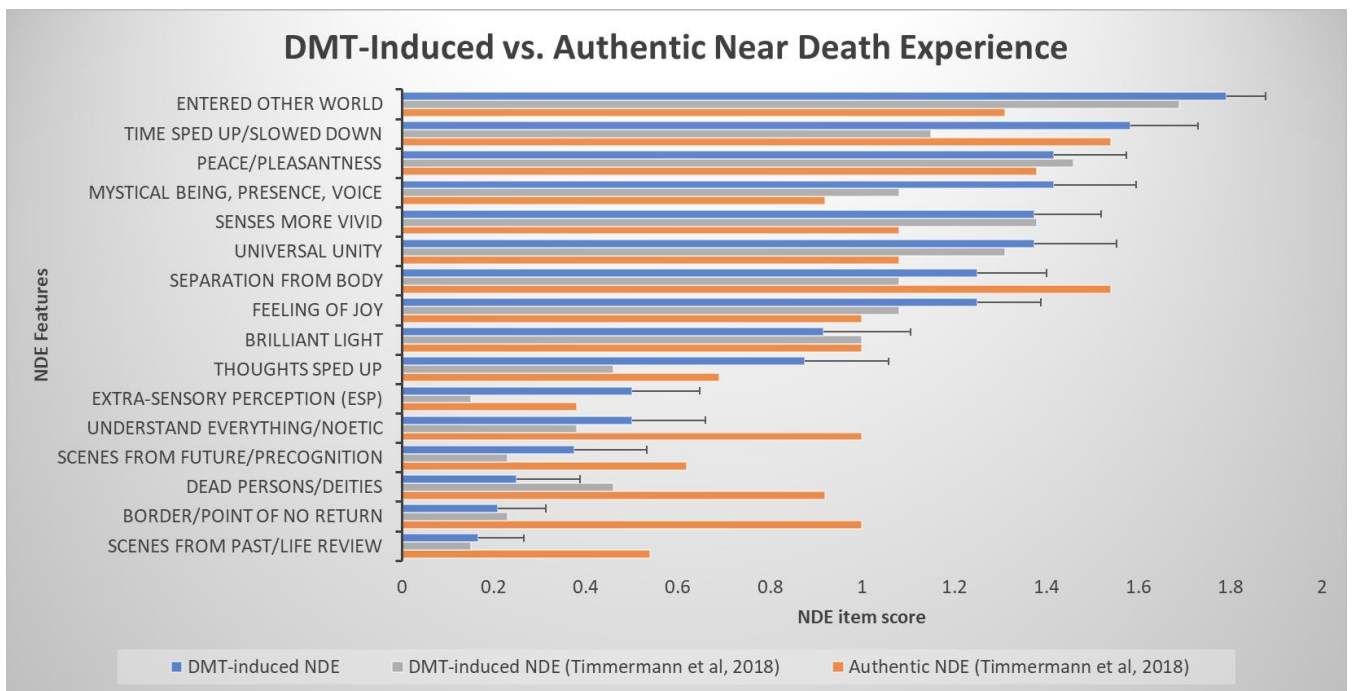


Figure 2.

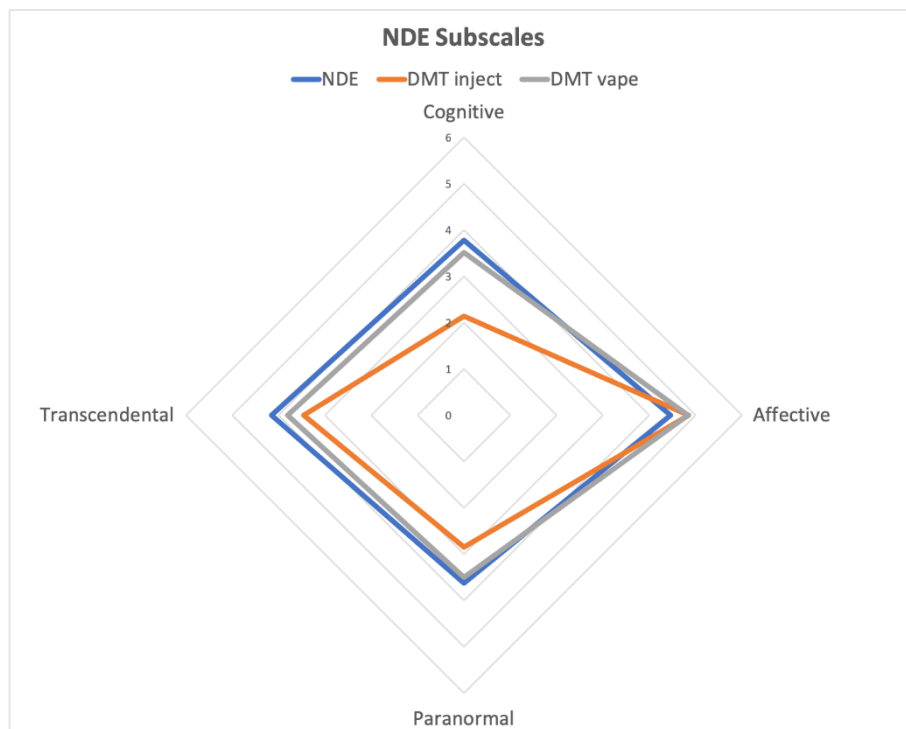


Figure 1 is adapted from 'DMT models the Near-death Experience', a laboratory DMT study comparing with authentic NDEs (Timmermann et al, 2018), where the results from the NDE Scale as applied to participants on the DMT field study of the present analysis is superimposed. The lab. study found no significant differences between the two experiences on all scale items. However, a very conservative mode of correcting for multiple analyses, Bonferroni, was employed – and although statistical analyses could not be performed due to lacking the raw data from Timmermann et al (2018), the incorporation of the field study data does reveal some apparent discrepancies, at least on a numerical level, between both the two DMT studies and between the field study and the NDEs. Reasons for this may be numerous. For instance, the number of participants (13 lab. study Vs. 29 field study), use of significantly higher dose (7+14+20mg in the dose-finding lab. study Vs. 55mg vapourised average, equivalent to approx. 20mg I.V), mode of administration, affecting pharmacokinetic action (I.V. Vs. vapourised), and the setting in itself, in turn influencing set (participants' homes Vs. laboratory environment).

Regarding differences between the field and lab. studies of DMT (again only numerically, but where substantial numerical difference may imply significant differences), The *ESP* item was rated more highly in the field study Vs. the lab., which may be owing to suggestion by being part of a study which as part of its measures included a parapsychological task, or may

indeed be a genuine reflection of ESP increase, due to many participants correctly scoring on said task. Comparatively, meeting *dead persons* was much more likely in the lab. study Vs. the field, which may be related to being in a clinical-type setting. *Mystical being* was also markedly higher in field study, which may be partially contributed to by the highly experienced nature of the subjects with DMT, their belonging to a psychedelic subculture with niche interests in such phenomena as entities, or familiarity with the PI's (DL) work on this topic. *Thoughts sped up*, and *time distortion* were also notably higher in the field study.

In relation to differences between the field study of the present analysis and the authentic near-death experiences – in general, the field study data shows scores on the NDE scale (constructed to specifically measure the NDE phenomenon) to be higher Vs. the lab. on most items, also possessing a higher overall score (15.6 vs 13.3/32). This curiously may render the *DMT* experience to be more 'NDE-like' than even the NDE. This is very clearly mirrored in Figure 2, which shows scores from each subscale of the NDES, where the field study DMT results map much more closely to the NDEs (especially on the cognitive and paranormal domains). In terms of comparing specific items, entering *other worlds* and especially encountering *mystical beings* are notably higher in the field study versus the genuine NDEs (amidst the highest 4 items), as are *vivid senses* and *thoughts sped up*. This is seen to be mirrored in the prevalence comparison of the present analysis (see chapter 5 main text, Table 4), where the breakthrough DMT experience is characteristically replete with entities in the context of a rich immersion in distinct otherly spaces. As such, breakthrough DMT trips virtually guarantees such experiences with these features, whereas the most common NDEs are in fact shallow (Charland-Verville et al., 2014) expressing the more superficial elements (Ring, 1980). In this way, a better conceptualization is that breakthrough DMT models 'breakthrough' (that is, deeper) NDEs. All this said, the higher scoring on these NDE scale items from the DMT study may create a greater discrepancy with the scoring by the genuine NDE subjects themselves, thus ultimately meaning DMT (on these items) are *more* dissimilar to NDEs.

Despite Timmermann et al (2018) finding the item scores to be the same between experience-types (though using the conservative Bonferroni) – the bottom cluster of features on Figure 1, that is, the *life review*, *border of no return*, and especially

deceased/deities (as well as precognition, noetic experience, and ESP) appear to be more likely in NDEs versus DMT (though only via numerical inspection), which is exaggerated when comparing only with the field study. This is salient, as these three exact elements may be, more than the others, those considered to be quintessential to the concept of dying or almost dying (i.e. a perception of personal proximity to death). As per the particularly low DMT field study rating for the *deceased* item, this may represent one reliable difference between the two states, where DMT could be viewed as less NDE-like on this factor. Bolstering this idea is the most reliable study on the frequency of features across NDEs (Charland-Verville et al., 2014), identifying that, among *peace, body separation, light, and time distortion*, meeting the *deceased* was one of the most common NDE features. This, again, is supported by the present results of the prevalence comparison (see chapter 5 main text, Table 4).

13 of the total 16 items on the NDES have a max. 'ranking' difference of 2. That is, when ranking the items on highest-lowest scores, the vast majority of them were only two or fewer ranks different between the field and lab. study. Constituting the only two studies of primary data collection of DMT experiences (field and lab.), this demonstrates remarkably similar (psychometric) results as to the NDE-like nature of the DMT trip. Importantly, despite the field study by nature not employing a placebo control, while Timermann et al (2018) did employ one while also finding no differences on all items, this evident similarity further validates the field study results as not influenced by expectation effects.

The results shown in Figures 1 and 2 above generally suggest a corroboration of the psychedelic literature, where emphasis is placed on psychedelics' capacity to evoke *mystical phenomena*, as well as *transportation to other place* and the *sensed presence* effect common to high-dose psychedelics and in particular DMT. If surveying the results above, from low-high ratings on the field study, and thus generally from a greater discrepancy with NDEs to a lesser one, the nature of the items become less NDE-typical and more mystical-typical. With this in mind, such mystical-type features may be acting to 'drive' much of the apparent comparability between DMT and NDEs – where, in order of ranking, all of *time distortion, peace/pleasantness, (vivid senses, albeit not mystical), universal unity & body separation* (again not strictly mystical, though related to detachment from the self), and *joy*; are amongst the highest rated.

This is versus the possibly more inherently 'NDE-like' features being amongst the lowest rated, including a *review of life, meeting the deceased* and the *border of no return*. Such lowest-scored items relative to NDEs vindicates Greyson's (2014) factor analysis of the Mysticism Scale and the NDE Scale, which yielded a specific "NDE" factor onto which precisely these three items preferentially loaded, i.e. which reliably differentiated mystical features from NDE ones.

Finally, scoring on the item *separation from body* may not be a reliable reflection of the prevalence of this feature differ, since the NDES does not adequately distinguish between the 'OBE' (which phenomenology in the literature suggests more classically occurs with NDEs) and 'body dissolution'/'unawareness of the body' (which literature, as well as the present DMT analysis, indicates is more typical of DMT). Comparably, the item of *light* on the NDES is equally as common between states, despite the "light" being ubiquitously associated with the near-death phenomenon (both popularly and in the literature), and more importantly emerging from a dark tunnel in NDEs only. These are only 2 brief examples of insufficiencies of employing quantitative questionnaires as measures, whereas when incorporating qualitative data, the experiences which are otherwise oversimplified with a discreet number of predefined categories are opened up to reveal the nuances of the content and its differential manifestation between, in this case, two altered states of consciousness. As such, the main text of the present chapter is entirely qualitative in methodology, to embrace this novel level of analysis, and thus enabling a deeper opportunity for comparison.

3.

Features from DMT Thematic Analysis not present in comparative analysis

An Encounter with the Other

No.

Interviews

/36 (%)

<u>Encountering Other Beings</u>	
<i>Transformation of persons present</i>	7 (19)
<i>DMT personification</i>	5 (14)
Role & Function	
<i>Helping or nurturing</i>	19 (53)
The Guide	8 (14)
The Soother	5 (14)
The Playmate	5 (14)
The Guardian	5 (14)
The Healer	4 (11)
The Muse	1 (3)
<i>Showing or communing</i>	17 (47)
The Presenter	10 (28)
The Teacher	9 (25)
The Focuser	5 (14)
<i>Manipulating or controlling</i>	6 (17)
The Experimenter	2 (6)
The Orchestrator	2 (6)
The Consumer	1 (3)
Appearance & Features	
Other animals	4 (11)
<i>Otherly Creatures – Non-human/Non-animal</i>	26 (72)
Humanoid	9 (25)
Clown-like / Jester	4 (11)
Octopoid	4 (11)
Insectoid	4 (11)
'The Grey- or Mantis'-like	2 (6)
Therianthropic	2 (6)
Baby	2 (6)
'Me' or Autoscopy	2 (6)
'Navi'-esque	1 (3)

Space invader-like	1 (3)
Synapse-like	1 (3)
Faerie-like	1 (3)
Indigenous spirit	1 (3)
Disembodied eyes	1 (3)
Stick creature	1 (3)
Bottle-like	1 (3)
<i>Sentient structures</i>	<i>9 (25)</i>
Sentient geometry	3 (8)
Building / Structure (Sentient)	3 (8)
Computer symbols/presence	2 (6)
Aztec patterns	1 (3)
Boxes	1 (3)
Candy cane / Pipes	1 (3)
<i>Specific features</i>	<i>9 (25)</i>
<i>Voice only</i>	1 (3)
Mobius strip	1 (3)
Multi-cultural	1 (3)
Planet-sized	1 (3)
Winged	1 (3)
Chained	1 (3)
Pods	1 (3)
<i>Visual quality</i>	<i>19 (53)</i>
Self-transforming	8 (22)
Geometric	8 (22)
Cartoon-like / 2D	6 (17)
Colourful	5 (14)
Mechanical	3 (8)
Hyperdimensional	3 (8)
High-Definition	1 (3)
Holographic	1 (3)

Metallic	1 (3)
Organic-mechanic	1 (3)
Demeanour & Nature	
<i>Charming and Inviting</i>	20 (56)
Benign / Friendly	9 (25)
Jovial / Happy	4 (11)
Motherly	3 (8)
Graceful	1 (3)
Sensual	1 (3)
<i>Other dispositions</i>	12 (33)
Curious	4 (11)
Childish	3 (8)
Urging	2 (6)
Panicking	1 (3)
Secretive	1 (3)
Confused	1 (3)
Stubborn	1 (3)
Aware of those present	1 (3)
Unaware of those present	1 (3)
<i>Nature</i>	17 (47)
One with or of the Beings	10 (28)
Familiar	10 (28)
Beautiful or Extraordinary	4 (11)
Powerful	2 (6)
<i>Expecting subject</i>	6 (17)
Did not expect	3 (8)
Expected	3 (8)
<i>Gender</i>	17 (47)
Feminine	14 (39)
Masculine	7 (19)
None	1 (3)

Communication & Messages	
<i>Communication mode</i>	14 (39)
Dance & Gesticulation	3 (8)
Visual communication	2 (6)
Contactability post-trip	1 (3)
Potentially communicative	1 (3)
<i>Messages received</i>	13 (36)
'The Cosmic Game' or 'Cosmic Giggle'	5 (14)
Love for Others and Self	5 (14)
Letting Go	3 (8)
Warning	2 (6)
Insight into the World	1 (3)
<u>Exploring Other Worlds</u>	
Scene	
<i>Human worlds</i>	6 (17)
Street	3 (8)
Re-enacted surroundings	2 (6)
Building / Structure (Non-sentient)	1 (3)
<i>Natural worlds</i>	10 (28)
Outer-space	6 (17)
Vulva	1 (3)
<i>Artificial worlds</i>	6 (17)
Mechanism	2 (6)
Icicle / Waterfall	1 (3)
<i>Children's worlds</i>	3 (8)
Playpen / Nursery	2 (6)
Circus-like / Children's book	1 (3)
<i>Nebulous worlds</i>	13 (36)
Lattice / Gridwork	9 (25)
'Tron-like' or 'Blueprint of Universe'	2 (6)

Light space	1 (3)
Ether / 'The fabric'	1 (3)
Contents	
<i>Organic objects</i>	<i>16 (44)</i>
Cellular or Subcellular	4 (11)
'Intra-Body Experience'	1 (3)
The Elements	1 (3)
<i>Technological objects</i>	<i>8 (22)</i>
Mechanics & Devices	4 (11)
Satellites & Spacecraft	2 (8)
Medicine	2 (8)
Car	1 (3)
<i>Infantile objects</i>	<i>3 (8)</i>
<i>Geometric objects</i>	<i>16 (44)</i>
Spherical shapes	7 (19)
Hyperdimensional structures	6 (17)
Other polyhedrons	3 (8)
Islamic-like sacred geometry	2 (6)
Flower of life	1 (3)
Mandala	1 (3)
Maze	1 (3)
<i>Symbolic objects</i>	<i>6 (17)</i>
Symbols / Signs	5 (14)
Ancient language / Hieroglyphs	3 (8)
Matrix code	2 (6)
<i>Miscellaneous objects</i>	<i>14 (39)</i>
Serpentine or Cyclic	7 (19)
Small barrel / tube	2 (6)
Sweets	2 (6)
Ladder	1 (3)
'Magic mirror'	1 (3)

Bible-like book	1 (3)
Chalice	1 (3)
Antique bathtub	1 (3)
'Spikey, jangley' thing	1 (3)
Quality	
<i>Transforming or Exploding</i>	7 (19)
<i>Synthetic textures</i>	15 (42)
Cartoon-like or Animation	5 (14)
Organic-Mechanic	5 (14)
High-Definition	4 (11)
Holographic or Digital	3 (8)
Retro-game or Old	2 (6)
<i>Generic textures</i>	11 (31)
Very colourful	5 (14)
Fluid / Organic	2 (6)
Painted	2 (6)
Blurry	2 (6)
'Razzmatazz' / Garish	1 (3)
Wavey	1 (3)
Ornate	1 (3)
Jewelled	1 (3)
Dream-like	1 (3)
'Organised Chaos'	1 (3)

Encounter with the Self

No.
Interviews
/36 (%)

<u>Onset</u>	
<i>Sensory</i>	14 (39)
Submergence	9 (25)
<i>Emotion & Body</i>	18 (40)
Laboured breathing	7 (19)
Terror or Panic	6 (17)
'The rush'	5 (14)
Anxiety or Fear (Onset)	4 (11)
Pain / Torture (Onset)	2 (6)
Trapped / Powerless	1 (3)
Body expanding / melting	1 (3)
<i>Space-time shifts</i>	10 (28)
Reality breaking down (Open eye; Onset)	4 (11)
Immediately elsewhere	4 (11)
<u>Bodily</u>	
<i>Pleasurable</i>	10 (28)
Ecstasy	4 (11)
Pain relief	2 (6)
Fusion (with partner)	2 (6)
Rooted	1 (3)
Stretching urge	1 (3)
Warmth	1 (3)
Post-orgasmic state	1 (3)
<i>Neutral / Both</i>	8 (22)
Religious hand-signs	3 (8)

4.

**Table of all super-ordinate,
mid-level and subthemes**

Vibrating or (Subjective) Convulsion	3 (8)
'Phytanthropy'	1 (3)
Falling sensation	1 (3)
<i>Uncomfortable</i>	9 (25)
Heaviness	1 (3)
Paralysis (Subjective)	1 (3)
Sensitivity	1 (3)
<u>Emotional</u>	
<i>Positive</i>	34 (94)
Peace / Pleasantness	16 (44)
Profundity & Beauty	14 (39)
Familiarity	11 (31)
Gratefulness	8 (22)
Humour & Hilarity	7 (19)
Healing	5 (14)
Release or Relief	4 (11)
Humility	3 (8)
Gentleness	2 (6)
Womb-like	1 (3)
<i>Neither / Both</i>	21 (58)
Extreme intensity, or Overwhelm	21 (58)
Letting go / Detachment	3 (8)
Wash of emotion	2 (6)
Ambivalence	1 (3)
Infantile regression	1 (3)
Disappointment	1 (3)
<i>Challenging</i>	7 (19)
Anxiety or Fear (During)	3 (8)
Confusion	2 (6)
Fear of letting go	1 (3)

Grief (from own death)	1 (3)
Guilt	1 (3)
Pain / Torture (During)	1 (3)
Personal struggles	1 (3)
Traumatic re-experience	1 (3)
<u>Sensorial</u>	
<i>Open-eye</i>	11 (31)
Other open-eye visuals	7 (19)
Reality breaking down or Pixilation (During)	3 (8)
Clairvoyant-like	2 (6)
Energy flow	1 (3)
Skulls	1 (3)
Depth-perception	1 (3)
<i>Visual</i>	27 (75)
Colourfulness	13 (36)
Fractals	11 (31)
Hyperdimensionality	8 (22)
<i>Cross-modal & Other</i>	14 (39)
Synaesthesia	10 (28)
Sound (During)	4 (11)
Sensitivity	3 (8)
Audio slowing	1 (3)
Tactile	1 (3)
<u>Psychological</u>	
<i>Memory & Language</i>	31 (86)
Temporary memory loss (within experience)	15 (42)
Partial recall loss (after experience)	12 (33)

Looping & Intrusive thought	4 (11)
'Schizophrenia'-like	1 (3)
<i>Awareness & Sense of Self</i>	<i>18 (50)</i>
Aware of surroundings	9 (25)
Unaware of surroundings	8 (22)
<i>Time distortions</i>	<i>13 (36)</i>
Time contraction	4 (11)
Other distortions	3 (8)

Encounter with Death

Clarificatory notes

No.
Interviews
/36 (%)

<u>Near-Death Experience, Death & Birth</u>		
<i>Typical NDE features</i>		34 (94)
Disembodiment		19 (53)
Translocation elsewhere	e.g. Sucked, Magnetised	12 (33)
Tunnel-like structures (During)		10 (28)
Bright light(s)		9 (25)
Sense of dying (During)		8 (22)
Tunnel-like structures (At onset)		7 (19)
Sense of dying (At onset)		6 (17)
'Limbo-land' / The Void	Between worlds, Waiting room-like	4 (11)
Light Being-esque		3 (8)
Deceased family		2 (6)
Hyper-empathy	Assuming the perspectives of others	2 (6)
Life-review-like		2 (6)
<i>Less typical motifs</i>		<i>14 (39)</i>
Birth imagery or Being born		5 (14)

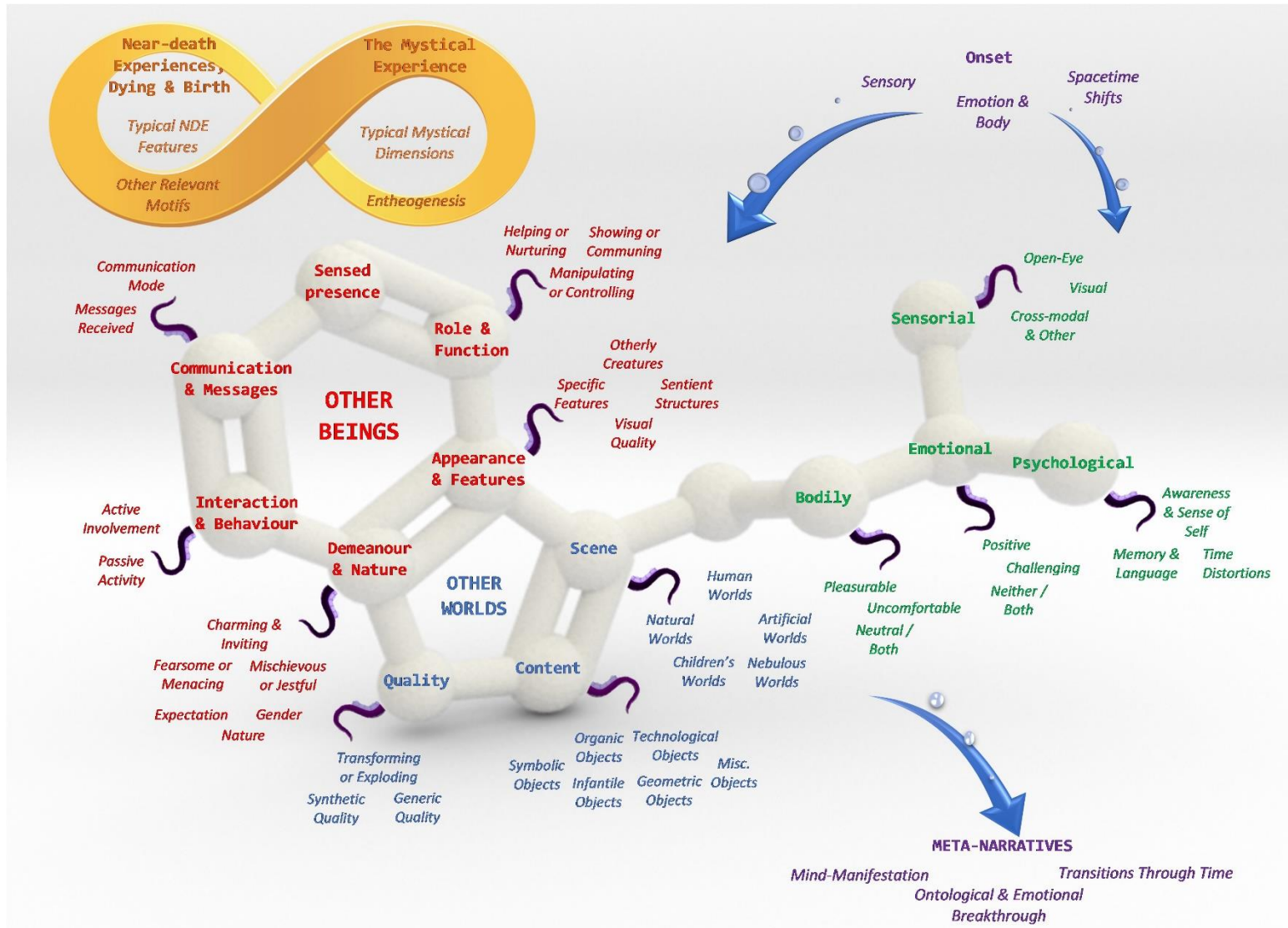
Death imagery & Skulls		5 (14)
Sounds (At onset)	e.g. Ringing, Rushing	3 (8)
Reduced fear of death (after-effect)		3 (8)
Etheric body		2 (6)
Being in prime		2 (6)
Partner lying dead	Participant pairs who experienced the DMT lying beside each other, in which one partner envisioned the other as seemingly dead	2 (6)
Dark & earthy space		1 (3)
'Placebo-death experience'		1 (3)
Psyching the Psychopomps		1 (3)
Scenes on screens		1 (3)
Repulsed by body		1 (3)

<u>The Mystical Experience</u>		
<i>Typical mystical dimensions</i>		29 (81)
Ego death	c.f. Temporary memory loss	11 (31)
Ineffability	c.f. Difficulty expressing	11 (31)
Deep positive mood	Sometimes including Love; c.f. Pleasantness; or Ecstasy	11 (31)
Unitive / Oneness	c.f. Connection	9 (25)
Noetic	c.f. Revelation	8 (22)
Time & Space transcendence	c.f. <i>Time distortion; or</i> Translocation	8 (22)
Paradoxical resolution		6 (17)
Sacredness	c.f. Profundity/Beauty	2 (6)
<i>Entheogenesis</i>	<i>The profound feeling of identifying with the Divine, such as being God or</i>	3 (8)

	<i>Creating the universe</i>	
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5.

Graphic of all super-ordinate and mid-level themes – including those of *Encounter with the Other* (Chapter 3), and *Self*



6.

DMT participants reporting NDE-like experiences

LG

LG (30-34y, M, Mixed British – Sri Lankan-German descent), curiously, reports that he felt (purely subjectively) that he was suffering a cardiac arrest, including the ensuing attempts at resuscitation, mirroring a scene expected of a genuine near-death experiencer. Following this, perhaps as a result, a number of NDE themes are recounted:

Sense of dying (both *at onset*, and *during*)

Also first touched on here is the singular example of *Grief*, not for another, but for himself given his conviction of his death, and empathising with the grief of his romantic partner.

“So I died... I felt as though I left earth behind. And that she [partner] was gonna have to deal with that... it was like, normal life, but that I'd had a fucking heart attack... I was like 'Fuck! This is it, she's gonna be devastated'. But then...I was going 'No, No...this is the nature of reality...and it's not always cushy, you don't know what's the round the corner, so whatever is going on at any point'. But then I was like, so I'm dead, I *am* dead now...

I felt as though you guys...you were standing around, you were looking down at me, trying to resuscitate me. You were like 'Fuck, fuck, no he's gonna die', and I was like 'Shit, this is it, this is it!'. Then *boom*, gone, I was just into this other plane”

Here, as well, is the sense of *Translocation*, via an initial sinking and then sudden zooming, elsewhere.

“The first thing was...being on my back, my vision was as though i was sinking... and I could see you guys...trying to revive me. And then 'No, fuck, this is it, there's nothing you can do'... I was trying to fight it, breathe slowly...but it was sinking more and more, and then 'this is it now, you're going to have to embrace it". And then it just switched, and I was like *vrrrooomhh* into this ethereal aura of whatever icicle thing...

It was like it was going in 2 directions, one was this physiological shit that was going on, and one was this plummeting down of 'this is your sprit going somewhere else', your essence or soul or whatever you wanna call it, *choooh*, and they were fragmenting off in different directions. And as soon as my body died, it just went *vroom* straight into this other...plane”

The preservation of ego (see chapter 4) versus its dissolution, is alluded to here – which is congruent with the majority of NDE reports.

“I was still me, my thought processes still felt the same... I was in the icicle, and slowly I was like 'I am dead, but my ego was still here, so death is like, so it's not that big a deal!'... the comprehension that everything is ever-changing, and your energy is still going somewhere else”

Etheric body

LG additionally described witnessing himself as a form of 'etheric body' – which while certainly observable in NDE accounts, does not seem to be especially common. This is reported by 2 individuals, but is technically categorised as '*Less typical NDE motifs*' (see below):

“I had my body, but it wasn't my physical form; it was like an energetic form, it was the same, the same age and everything, but I was semi-transparent

Interviewer: A kind of spirit body?

Yeah! And I was just there like What the fuck is this, I couldn't even pay attention to the surroundings that much because I was so distressed by the fact that I was dead (laughter)”

Peculiarly, he mentions an autoscoping, not of his own (actual) body, but of this new form of 'body', accompanied by a duality of his own mind. The pain of his unique grief is also re-expressed:

“It was weird, I could kind of see myself, and I was myself at the same time. It was almost like two perspectives going, my internal dialogue and also viewing my face,

like the shellshock, the magnitude of what's just happened... There was almost like a feeling of, I guess it was grief that set in, grief, but not for me, but for her...

I was like, 'No everything is so fucking amazing between us', I love her, like, fucking more than anything, it was like how could I do this, how could I leave her to deal with the pain of my loss, and what it would be like to be the other way around!?!... it's just the sorrow of not being able to see that person and kiss them. I was just fucking devastated...

I'm in this [other plane] for eternity... I didn't mind I was dead, it was the fact I'd never get to see her again...

it was like I was experiencing this internal dialogue from [one] point of view, like looking outward; but then there was like a parallel perspective going on, and it was looking at my face...watching my facial expressions. But I could experience my thought processes from both perspectives almost. One was kind of like the first [part of] the experience of going through death and acceptance, then the other was an observation point of view of 'this is what it looks like to experience that emotion'

Tunnel-like structures (*at onset, and during*)

Importantly, *LG* announces this particular experience to be "not like the 'tunnelly ones', traveling towards it", clearly alluding to the commonly-known trope of moving through a tunnel, but instead feeling an artificial, "vertical column" to be moving around himself. Also identifiable here is the feeling of levitation, and messages communicated by alien-like, and reassuring entities (see Chapter 3, 4):

"But then I was like, so I'm dead, I am dead now. Then I was looking around in this plane. It was blue, like waterfalls coming down around me...

Then *boom*, gone, I was...with these waterfall cascading things, very digital in feel...

I was trapped in this...vertical column and I was in it, like an icicle, like I was in the middle of an icicle. I was looking around and it was kind of almost digitally *Matrix*-esque, like blue swirling around me going round to the ground... there were some forms, like faces, like coming out of this *Matrix*-esque mesh and looking towards

me... [saying] 'No, you got to accept what's happened here now...This is the nature of how energy works – its gonna revert back on itself at some point'...

these kind of feminine forms...kind of *Avatar*-esque, like cartoony, blue, braided hair, kind of very high definition though...sharp... I've had this with ayahuasca, [entities] turning up like this, giving you some sort of expression... welcoming, almost slightly seductive, not in a sexual way, like 'it's all good'"

In a subsequent communication to the author (PM) by LG, the participant provided an elaboration on his experience: He reported an "acceleration" within the tunnel; he additionally referred to the vertical, holographic/digital 'icicle' and 'waterfall'-like tunnel' as a "cone"; he experienced auditory-visual synaesthesia as he spoke, where the words would transform into "Shapibo symbols" or "Egyptian hieroglyphs" onto the walls of the tunnel; and his etheric body appeared to have "extra dimensionality". The beings he encountered were "feline, and revolving", and gave him the understanding that the place he was in was "a place of sensual pleasure"; they demonstrated an initial shock to his appearance in their space, followed by a recognition, communicating that "You are not meant to be here, this is the place you come when you die", where they attempted to "calm me down", conveying that "You have to accept this [i.e. that you are dead]". There was a sensation of having "been here before".

As such, these extra features not only highlight even further the classically DMT-like nature of the content, but entail features usually absent from the NDE including symbols/glyphs or a hyperdimensional body. The use of 'cone', as well as 'icicle' or 'waterfall', to describe the tunnel of light is interesting, which echoes descriptions used by clients of hypnotherapists regressing to 'intermission' states (purportedly between lives), including "lying on a table under a 'dome' surrounded by bright light", or "group souls" to which persons return to at death being "surrounded by 'bright cones' above and all around us", funneling energy "as a waterfall in a spreading circle" (Shushan, 2022; p 146, p 151). The startled entities' message that he was, erroneously, in the realm of the dead concretizes the theme (see original manuscript) of 'psyching the psychopomp', where the participant stresses this features' role in his conviction of being in said realm. To extend this important theme further, another

anonymous presenter at the 2022 Tyringham Initiative conference, Broughton Hall, additionally experienced during not only one DMT experience entities which he overheard to say “There's a human! He's not dead yet, leave him alone! Be careful, if we fiddle with them something might happen. He'll get here eventually”.

EM

Sense of dying (*At onset, and During*)

The DMT experience of *EM* (20-24y, F, White Romanian) also begins with the sensation of dying. But, of note, for her at least it is one generated only by virtue of the inhalation of the substance itself. Also evident throughout the excerpts below is the sense of familiarity, present even in her first uses of DMT, such as the familiarity associated with death – which is a common feeling in true NDEs:

“So I was faced with this familiar feeling of like, when you smoke DMT, it feels like...a very familiar sensation; it's like between birth and death, that always keeps occurring

Interviewer: Was that your prior, usual experience?

Yeah but...I'm firmly convinced that [the feeling of dying] only comes because of the feeling of intoxication that I get from actually smoking. Because you feel like you're actually putting something into your body, and literally it's a feeling of intoxication

Interviewer: Intoxication to the point of potentially dying? ...a poisoning perhaps?

Exactly! Proper intoxication”

Disembodiment

Crucially, *EM* here is emphatic that though she lost all awareness of her body, it was “not like an OBE” as in classical near-death experiences. One consistency though with NDEs, akin to *LG* above, is her eventual allusion to a preservation of her selfhood as distinct from her surroundings:

“I was a very compact point of consciousness... my body was more like a ‘ball’ or something, but I definitely wasn’t aware of like a human body or something...

So it was definitely not like an OBE, definitely not. I can’t necessarily say if I was returning [to] or ever exited my body, I don’t think I’ve ever done that. I think at some point my conscious voluntary thoughts were stopped and I entered this new world, but I never at any point felt like I had left my body...

I was still that contained point of consciousness, so never at any point I felt like I moved from here, I was exactly where you guys left me at all times... mentally I was definitely somewhere else. But I don’t feel like I left my body...

I was an individual presence, I was separate from [the entities]”

Tunnel-like structures (*At onset, and During*)

Again, similar to *LG*, her tunnel structures appeared in the opening stage of her experience, but were ever-present throughout, and moved themselves around – compared to NDEs wherein the tunnel feature is simply a transitioning phase (with more developed NDEs) to a wider experience, and the experient moving through. Their nature as transforming, fluxing, colourful, and paradoxical (see Chapter 3) is also stereotypically psychedelic (though their sensed reality and familiarity is NDE consistent):

“So there's this massive, massive building... there's like all these different shapes and tunnels... you can go through different rooms and...every single room is basically like a Pandora box. But it’s not a room per se... It’s just like full of different shapes and tunnels and morphing rainbow stuff everywhere. So every single thing has the ability of turning into a tunnel. So you’re just going through all this stuff, then at some point I realised the room I was in was kind of morphing and I was into (?) one of those tunnels and the tunnels were splitting, and it was fun!... you’re trapped in this never-ending tunnel that moves around but you’re still fine...because you...just go with the flow...

like ventilation pipes, they’re very messy, they don’t seem to make much sense where everything is... So you know those spirals, when it’s wider here and it goes

narrower, and it was spirally – you know, the barber shops, like that everywhere... It was all colours, like lollipops...

when the actual tunnels appeared – [they were] moving around...twisting in the other direction... but there are different layers of the tunnel, and all my friends [entities] were running around in between them and coming through them... everything was moving all the time! Yeah, a lot of movement, very dynamic process... But in a very organic way...

It was like the tunnel was moving me...I definitely didn't put in any effort... So I was both consciously travelling through them and they were moving around...

they were pretty real, they were pretty damn real structures... There was definitely travel at first through tunnels. Very familiar tunnels... in DMT, all the time, the onset feeling is filled with familiarity”

Bright light(s) (and Entities and Other worlds)

When describing her “building”, which was sentient and transforming also, the lighting described is also reminiscent of NDEs. And her otherworldly, intricate garden scenery is a natural landscape exceptionally common throughout near-death reports (incidentally, all such elements are in *RH's* 1st trip, Chapter 3):

“It definitely seemed like...a construction that has a mind of its own in a way, because it was moving around and everything was changing inside. It was very well-lit...there was a lot of natural light coming in – but there were no windows, which was absolutely crazy...

It had gardens as well...it has rivers and everything, it was just like one of those palaces from ancient Babylonian gardens or something, it was beautiful. And every single bit of the wall, you know, like mosques have all these patterns and all these beautiful glass like stuff inside, that everywhere, on every single little bit” (RH 1: 55-59y, M, Asian British – Indian descent)

She also illustrates in her experience benign, protecting entities of humanoid form – congruent with NDEs – yet again, their visual manifestation of featureless “dancing harlequins” is classic of DMT (see Chapter 3), and absent in NDEs:

“It felt very communal...it was so beautiful, and these people were so nice, all these aliens around... All those, there must have been around 50 entities and they all seemed to be my friends, it was so nice to have all this community of harlequins...

So you know those costumes that people put on when they don't have their face, that's just like a colour... A body suit... they're just going around like a lot of spinnny things, they were watering certain bits... And I felt so taken care of it was absolutely amazing, and there were shit-tonnes of them!... like, fixing bits and pieces, but it was like a dance”

Other NDE-like cases to lesser degrees

Several other interviews are also redolent, though not quite as strongly, of the near-death experience literature. *RH (2)*'s themes of dying at first, its terrifying nature; entry to an inescapable void; and ultimate encounter with a being of light have all already been discussed in the above section on *Qualitative comparison*. *RH (1)*, not dissimilarly, contained within it themes of initially dying, its disturbing nature; the void i.e. the “terror” of being “trapped” in a “waiting room” that “doesn't make sense”, which is, notably, progressed through upon his mantra, “Die to it”; confronting fearsome, disembodied eyes i.e. “Something conscious, which was red” with a “Crazy number of eyes” and was “really scary”; a light-being-esque “feminine presence”, looking “metallic, rose, gold, silver”, “shining”, and “bigger than a planet”, and communicating the message ““We thank you””; “light space, nothing except light space. Really comfortable, really beautiful – it felt like home”; and finally a “more than...5D... garden, of extraordinary beauty”. Progressively less evocative of NDE tropes includes *AN*'s descriptions of bodily and ego dissolution (not a sense of dying, *per se*); entry to a dark, earthy space i.e. “submerged... in the depths” in a “churning of deep purples and blues...crazy mud colours” with “rooted...dark...feelings”; from which a “ladder from above and below” arose, made of “cogs...joined”, and “met in the middle”, finally “twisting into” a “golden light”. Thus, *AN*'s experience echoes the rebirth motif or ascension from a primitive state into one of beautiful light (e.g. see chapter 6, on Alexander, 2012). *TC*'s trip entailed a transcending of the ego; being “sucked” into a “contracting, expanding... tunnel-like thing” or “void”; and then “flying through” light and natural landscapes i.e. “bright...scenery, like mountains”, “like a cave, beautifully

illuminated". *AV*'s account of a sense of dying; her being encompassed by a sentient sun-like mandala was discussed above (*Qualitative comparison*); which communicated a "telepathic message" in "a voice, telling me to 'surrender, this is a sacred space, you're being held, you are safe'", again evoking the sense of sacredness. Lastly, *JB* states an ego-death and "melting into the universe"; a "rushing, breaking-through, noise...like a *fhoo*"; while "going through... a red... geometric... tunnel"; and ultimately a union with a "Oneness, an Everything entity, a Universal entity of just, you know, God or whatever!"

Perhaps of interest, is that the majority of these, including *LG* and *EM*, involve the sense of dying at the very onset, or if not, the reporting of an ego-death – which may in itself partially account for the ensuing NDE-like tropes, if creating a suggestion for death-pertaining motifs. Saliently, in terms of the qualitative content of, at least these particular discussed themes, of these partially NDE-like DMT trips, it appears consistent with authentic NDEs. Except for, for instance, beings of light witnessed as 'synapses' (*RH 2*) or 'mandalas' (*AV*), the intimidating eye-adorned being (*RH 1*, however, see Luke, 2008 on the cross-culturally and trans-temporally recurrent portrayal of many-eyed demonic entities associated with death, specifically), cog-composed ladders (*AN*), and perhaps too, throbbing (*TC*) and geometric (*JB*) tunnels, and hyperdimensionality (*RH 1*) – all of which being more expected in DMT versus NDEs. In addition, while *AV* and *JB*'s experiences were highly mystical in nature (see this appendix, 1., 'Mystical Experience'), many others, namely the most NDE-like *LG* and *EM*, lacked such mystical dimensions, where NDEs (see *Quantitative, and Content Comparison*, main text) tend to show preservation of ego and independence from the environment. Though, naturally, mystical DMT trips will mirror mystical NDEs.

7.

Narrative of Idiosyncratic NDE (Cassol et al, 2018)

Patient DTO7

It was during one of these [suicide] attempts that I experienced what I call a "DIVINE ENCOUNTER EXPERIENCE" in which GOD manifested himself to me and my life "swung" completely and instantly... Many times I fell to my knees and with my arms outstretched to heaven I asked God to come and "seek" me in order to free me from my suffering... I swallowed what remained of the pill bottle and I drunk half a bottle of cognac... All of a sudden I woke up on a stretcher in intensive care...

I was terribly thirsty and I sat in my bed and asked the nurse for a drink. She couldn't hear me, she wouldn't answer me! I spoke louder and the same thing, and then she turned around and spoke to another nurse behind me, something unrelated to me. I thought she didn't know I was there. Exasperated, I decided to get up to have a drink and got out of bed. I was standing next to the stretcher and looking at the stretcher, someone was lying in it, ME! I knew I was out of my body but didn't want to believe it and I repeated my request to drink by standing close to the nurse and I SHOUTED "DRINK". Still no answer! Then, like a thick black veil, like a light that goes out, this "black" fell into the room. At that point the nurse turned around and looked at the cardiogram and said to someone "we're losing him!" These were the last words I had time to hear because the "black" totally enveloped me, cutting me off from everything. I couldn't see anything, I couldn't hear anything, and I was afraid as if being afraid in total darkness in an unknown place. Then I cried out of fear, "I want light!" Then a MINUSCULE dot appeared in the distance, as when looking at a star from the sky. From this point came a ray of light, thin and opening more and more in front of me, a white light "IMMACULATE, PURE AND BRILLIANT OF AN ENERGY FROM WHICH I FEEL AN UNCONDITIONAL AND LIMITLESS LOVE". This light reached me and enveloped me just enough so that I could "MOVE FORWARD" into this light. I did not walk forward, but felt as if I was drawn into that light, and only my will moved me forward... I continued to advance in this light AND I KNEW THAT I WAS LEAVING LIFE LEADING ME INTO THIS LIGHT TOWARDS WHAT MAY BE CALLED "HEAVEN". Then one of these people raised her arm and hand in a stop sign and said, "WHERE ARE YOU GOING?" I answered: "I am going to heaven", I cannot live on earth, I am unable to do so, my suffering is too great that I can't bear it anymore "The person answered me: "STOP, YOU CAN NOT ADVANCE INTO THIS LIGHT, YOU WILL CONTAMINATE IT, YOU KILLED YOURSELF!" Then this person spoke to the others again and

said, "YOU WILL GO BACK INTO YOUR BODY AND GO TO COMPLETE YOUR "MISSION". I said, "I can't do it alone, I can't do it."

Then I felt "pushed" by force in this light towards my body. I sat "square" in my bed and the nurse was looking at me, and I said, "I HAVE SEEN GOD!" Then I fell back into a deep sleep and awoke the next morning. The next day I asked the nurse if she had heard that I was asking her for water to drink? She replied: "YOU NEVER SAID A WORD, YOU WERE IN THE COMA AND WE MANAGED NOT TO LOSE YOU. YOU GOT UP AND SAID: "I'VE SEEN GOD"..."

[Later, in Summer of 1986, he reports a depressive episode and not eating for several days, and upon going to sleep reports the following]

I awoke and it seemed to me that the shelves of the library next to my bed were "sinking" into the ground. There was something weird and I knew I was ALERT. Then I felt an unpleasant sensation as if I was stuck against something in my back and my body half-penetrated...the ceiling of my room. It wasn't the library that was sinking into the ground, it was me raising myself to the ceiling. And now I was half-way into the ceiling and I found it VERY unpleasant. I wanted to turn around and turn up as you move your physical body but it didn't work. I got angry and I ORDERED that I wanted to turn around and I turned against the ceiling, something that was VERY uncomfortable. I understood that the movement of the body was done by means of THE WILL; then I ORDERED to be standing next to my bed, which was done. I saw the room in the same way as usual and everything was REAL, NOT IN A DREAM WHERE EVERYTHING IS INTANGIBLE, A LITTLE BLURRY, ILLOGICAL. Here EVERYTHING WAS NORMAL AND I UNDERSTAND that I WAS OUT OF MY BODY... A cord of light connected me to my body on the bed and was connected to the navel. Then I walked towards a wall and as close as possible, I looked and saw that the wall was "LIVING"; I could see the atoms moving in the wall. I then passed my hand through the wall to find out if I could get out of the room and my hand went down into the wall but it caused me a VERY UNPLEASANT feeling and excuse-me the expression but it was as if I had put my hand in a bunch of hot (or lukewarm) excrement... Then I walked around the room and wherever I went, this cord spread and I could see it drawing a line in the room as I passed. There was a book on the table and I stepped forward to "READ" what was on the cover BUT I'M NOT CAPABLE; IT'S LIKE I CAN'T READ ANYMORE...

Then I turned around and looked into the corner of the room. I saw a tiny point of light appear but BLACK (if you can conceive the idea of a BLACK light), and as in the hospital...this point grows to become a small mass, a mixture of material with a slightly viscous appearance and a gaseous cloud. Then in this mass, an imprecise shape, a face took shape and the more I watched this thing form the more a "human" face appeared until that face that appeared to me was MY OWN. This "SHINING" face of a BLACK light from which rays were escaping, but I "FELT" a "negative" energy emerge from it. Then this face says to me: "COME WITH ME, WE CAN CRY TOGETHER FOR ETERNITY" "WE CAN RELIEVE OUR SUFFERING THUS (I must say here that no words were exchanged and that I express here in "WORDS" what was communicated only by thought)... I felt a negative energy emanating from this entity and I was suspicious of it, and then I felt that it wanted to "deceive" me. It wanted to lure me to itself to relieve itself of its own suffering (what do we most want when one is sad? A person to "share" this sadness). I felt that if I said "yes" to this entity and agreed to go with it, it was in death that I decided to go, and I had a choice to make: DECIDE TO LIVE OR TO DIE.

Then I saw a river where all kinds of other entities were "swimming" and "floated" that ALL SUFFER, CRY, IN A TYPE OF "LOWER ASTRAL" [REALM] WHERE ALL THE MOST BESTIAL, WILD OR UNFORMED ARE MATERIALIZED AND FORMED THIS RIVER IN WHICH THESE LOST SOULS WERE IMMersed, (IDEAS HAD SHAPES) SOME WERE LIKE LONG, UNFORMED SNAKES THAT PENETRATE YOUR BODY, OTHERS GROANED LIKE AN EMBRYO OF "SOMETHING" NOT YET BORN AND WANDERED AIMLESSLY, ALONE WITH THEIR SUFFERINGS WHICH THEY CONSTANTLY SOUGHT TO RELIEVE BY SEIZING THE ATTENTION OF OTHER ENTITIES. MY GOD, THIS WAS INTOLERABLE, UNBEARABLE; AND I UNDERSTOOD THAT SUICIDE IS NOT A "SOLUTION" BECAUSE WHEN ONE COMMITS SUICIDE ONE REMAINS IN THE SAME STATE AS ONE IS IN AT THE TIME OF HIS DEATH AND THAT ONE IS, FOR AN INDETERMINATE TIME AND BY GOD ONLY KNOWN, CONDEMNED TO "WANDER" IN THIS LOWER ASTRAL [REALM] WITH THESE OTHER ENTITIES AND THAT OUR SUFFERING BECOMES THUS PERHAPS ETERNAL (TO THE GOOD WILL OF GOD HIMSELF). SUICIDE IS A "TRAP" BECAUSE IT DOES NOT SOLVE ANYTHING AND IT EVEN MAKES THINGS WORSE BECAUSE IT BECOMES PERPETUAL. SUICIDE IS THE GREATEST SIN AGAINST GOD BECAUSE IT IS TO DENY LIFE ITSELF AND TO DENY GOD HIMSELF! I understood all this and I believe that this "lower astral

[realm] could be what we call "HELL"! AND IN MY SOUL AND CONSCIENCE I COULD NOT ACCEPT THIS AND THAT DEEP DOWN IN MY SOUL I WANTED TO "LIVE", SO I SAY "NO" TO THIS ENTITY AND THAT IS ENOUGH TO PUSH IT BACK.

SHE "DEMATERIALIZED" HERSELF AND DISAPPEARED INTO HER VISCOUS BLACK CLOUD. Then a light coming from the top penetrated me from the top of my head and descended into me. As it descended, my whole (astral) body relaxed completely and when that light reached the level of the heart, I felt like an explosion of PURE LOVE, UNCONDITIONAL, A CONCENTRATED LOVE, and I felt bathed in this love. Then as a huge hand coming from above penetrated me through the top of my head and that hand made its way among my ideas, my emotions, my feelings, packing things and pushing others aside, she was looking for something "SPECIFIC". I felt invaded by something totally unknown, and I was totally helpless, so I was scared and I felt like a little "violated" in my inner self, not physical, but in my soul and I asked, "WHAT ARE YOU?" and a voice answered me: "I AM THE HOLY SPIRIT, I AM A FORCE OF LOVE, I CONTROL ALL YOUR ESSENTIAL FUNCTIONS, YOU HAVE NOTHING TO FEAR. " I felt that this force was "digging" in my soul and I asked, "WHAT ARE YOU DOING?" The voice replied: "I KNOW YOU YOUR SUFFERING, YOU WILL NOT NEED IT ANY LONGER." Then I felt this hand grab something in me and throw it away.

The light disappeared and I stood there, stunned, and after what had just happened I became afraid not knowing what might happen to me again. The desire to reintegrate into my body became urgent and I gave in a little to panic. I felt like I was "running" and "throwing" myself into my body, no matter what would happen. Just before I reintegrated my body, I was like half between my body and outside, I felt at that moment like a click at the kidneys and a crack at the neck and an invisible hand guided me in my body. But I had to reintegrate back into my body way too quickly....

Then little by little my thoughts came back to me; I was "filled" with energy, of such intense strength that I could have run miles to spend it, but physically my strength prevented me from doing so and I had to hold onto the walls to sit in a chair. All my limbs trembled and inwardly I was so full of energy that I sat for a long time waiting for that energy to dissipate. I KNEW SOMETHING HAD JUST HAPPENED BEYOND MY COMPREHENSION AND I MUST SAY THAT I NEVER AGAIN EXPERIENCED THE "TASTE" OF USING ANY DRUGS WHATSOEVER AFTER THAT. WHAT "GOD'S HAND" HAD TAKEN AWAY FROM MY SOUL, MY "SUFFERING,"

HAD FOREVER LEFT ME. IT CHANGED MY WHOLE LIFE AND SOON AFTER I MET MY SOUL MATE, THIS WOMAN WHOM I LOVE AND WHO IS STILL WITH ME TODAY, WHOSE MOST FORTUITOUS MEETING CAN ONLY BE GOD'S PLAN. For 15 years now, I have not felt the taste for consumption and I have understood that the "MISSION" entrusted to me was to HELP THE PEOPLE THAT LIVE IN THE HELL OF DRUGS AND TO SHARE MY EXPERIENCE TO INFORM ON THE REALITY OF SUICIDE, PEOPLE WHO BELIEVE THEY HAVE FOUND A SOLUTION TO THEIR SUFFERING IN THIS WAY, AND ALSO TO COMMUNICATE MY EXPERIENCE TO TELL PEOPLE THAT GOD EXISTS AND THAT DEATH IS THE END OF NOTHING, THAT SOMETHING EXISTS BEYOND DEATH, THAT WE ALL HAVE A VERY IMPORTANT "MISSION" TO FULFILL IN THIS LIFE.

8.

Indicative Questions of Semi-Structured Interview (with initial prompts)

- Please can you describe your DMT experience as best and fully as you can, and as chronologically as you can. Please use all your own words, and try to break down your experience into its detailed elements, while avoiding using terms and concepts from other people or popular culture

- What is the first thing you remember?

- How did your body feel during the experience?

How did your awareness of your body change?

- Did you see any geometric, fractal or entoptic patterns?

Where they colourful, or moving? What was their dimensionality?

- Where did you 'go' in your experience?

What did the scene look like?

- Did you have any encounters with other beings in your experience?

What did they look like? What was their approach toward you? Did they communicate with you? Did they interact with you?

- Did you receive any information, or have any particular insights or understanding?

- How was your sense of time affected during the experience?

How long did the experience seem to last? (Versus how long it *did* last)

- How pleasurable was the experience?

What other emotions did you have?

- What was your sense of self like?

In relation to the world around you?

- On a scale from 1-10 where 10 is the most intense and 1 is normal intensity of experience, how intense did your experience get?

9.

Canonical NDE Themes – Different Content – Life Review-like

That the message to DMT participants SH & AF was also given by flirtatious, feminine guides makes these encounters of striking comparability to the Epic of Gilgamesh, which has actually been speculated as the first NDE documentation (Shushan, 2022). Specifically, the words, as quoted by Zaleski (1987), of the barmaid Siduri, who was “at once temptress and wise woman” may be interpreted to contain both such elements of hedonistic abandon as well as commands of responsibility, where she counselled Gilgamesh, after he “tunnels through the underground realm where the sun travels at night”, to relinquish his obsessive quest for the antidote to death:

“Thou, Gilgamesh, let full be they belly,
Make thou merry by day and by night.
Of each day make though a feast of rejoicing,
Day and night dance thou and play!...
Pay head to the little one that holds onto thy hand,
Let thy spouse delight in thy bosom!
For this is the task of [mankind]!”

Appendix D: Chapter VI

1.

Example questions from semi-structured interview

(including paraphrasing of participant’s prior answers)

Please describe in as much detail as possible your experience with 5-MeO-DMT

...in your narrative [of] your NDE there was a rich visual, multisensory component... so was there any kind of sensorial or visual experiential structure as well [in your 5-MeO]?

It was very interesting you said that having had the NDE, then latterly the...5MeO, those experiences might have had some echoes of the NDE sheerly because you had the NDE in the first instance...[is] that fair to say?

So it may not be the quintessential content or essence of these experiences which differ fundamentally, but maybe the approach to them, maybe even ritual and integration around them could actually be the determining factor as to how close they come together?

Can I ask for an elaboration of what you refer to as the 'counterfactual' which was quite evident in your NDE, this view you can have as your higher soul where the linear structure of time is dissolved away, and what does that mean?

So you think there's a much deeper dimension of the personal, what's reflective of your entire life on earth within the NDE... However, with...the 5MeO, there's...this sense of profound unity and oneness...and has much less of this personal component?

I [also] wonder what your comments would be in terms of the threshold of no return that comes up with NDEs, and it doesn't seem to be that prevalent with DMT?

Was there any memory of transition from these personal aspects like the review, toward this transcendent deep time space?

...you tried to recapitulate aspects of your NDE with 'sacred acoustics' which might be targeting these deeper brain structures, the reticular nucleus etc – you think that reticular nucleus may be shared in terms of your trying to get back [to the NDE] and the NDE itself? Do you think DMT have had a role in disturbing the reticular formation in your NDE?

You mentioned there some classic psychedelic fractal type tiles, so that echoes...Sam Harris, when he says your experience looks exactly like a DMT experience – but the key work is "look"? Where [you're suggesting that] those deeper ineffable experiences and aftershocks are fundamentally different?

So you had no prior real conviction of understanding of reincarnation before your NDE, but within the NDE there was this compelling understanding of that being a necessary component of the universe?... did you have anything of that nature in your [5-MeO-DMT] experience?

Appendix E: Chapter VII

1.

Example Questions of Semi-Structured Interview

(including paraphrasing of participants' prior answers)

DMT

...the beginning thing was this portal of some kind, this sphere of colour and patterns? So why a 'portal'?

...is it correct to say, after that you had this feeling or fear or sensation of dying?

...what other bodily kind of sensations did you have, going into it? Your awareness of your body?

And you didn't see [the presences]? They were guiding you. What was their intent or demeanour?

How much time did you think elapsed in your own subjective experience?

So this joker [entity]... seems to be a regular... What did he, what was he like; being a bit mischievous, playful, menacing?

So what was 'carnival'?... You mentioned this rush and intensity of things.

NDE

So you clearly you had some subjective experience upon your body going through some definite histaminergic trauma? So lets flesh this out a little more

Later it became more iconic or detailed, this blue space, these 2 eyes gazing at you, and you associated that with the Buddha, but you were actually identified with those eyes...?

...I wonder about your feelings of its 'otherliness' and status in that respect?

...what were your emotional experience, you said it was pleasant? Was it reassuring...?

So at some point you formally formulated it in your head, 'yes, this is a possible explanation, I died at some point, and either I'm in a different place or experiencing a different consciousness'?

Comparison

Lets loop back to your changa experience... How do you think it compares to this experience we went through?

Were there parallels with that with the changa?

What were the major differences?

Mystical experiences in your NDE, sense of time perception, sense of self – how was that in your changa experience?