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Do consumers go through imagery processing processes differently? The interplay between imagery-evoking level and multidimensional mental imagery in airline ads processing

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ABSTRACT

Research on airline ads mainly investigated the effectiveness of verbal messages but not pictorial information. Previous research on mental imagery focused on each mental imagery dimension level the ad could generate instead of investigating the underlying path differences with different imagery-evoking level ads. Our study investigates the role each mental imagery dimension plays in people's imagery processing process when exposed to varying levels of imagery-evoking airline visual ads. This research adopts a scenario-based experiment approach. A total of 246 scenario experiment surveys were collected in the UK. Participants were randomly allocated to one of the two real-world ads (imagery-evoking vs. less imagery-evoking). The findings are consistent with the elaboration likelihood model. When ad viewers process an imagery-evoking ad, the information processing is more elaborated. The vividness dimension plays a dominant role in the ad processing than the quantity dimension of mental imagery. The valence dimension of mental imagery mediates the relationship between vividness and purchase intention. When ad viewers process a less imagery-evoking airline ad, they rely on the quantity dimension for heuristics and the vividness dimension for relevant consumption information. The relationships between quantity and vividness dimensions of mental imagery on purchase intention are mediated by valence.

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Mental imagery; quantity, vividness; valence; purchase intention; visual stimuli; airline advertising; elaboration likelihood model

Introduction

Advertising in the tourism industry is different from other advertising, especially compared to ads for tangible and everyday products. Before purchasing, consumers cannot test tourism services or experiences, such as flights, hotels, and destinations. Ads must engage consumers and evoke mental imagery in the consumers' minds. Ad viewers use mental imagery to visualize themselves receiving services or visiting places. High-imagery ads encourage consumers to visualize themselves taking part in the advertised product or experience. Research on airline advertising is scant despite the importance of airline

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advertising in the tourism industry (Byun and Jang 2015). Airline advertising worldwide decreased by 63% in 2020 due to the impact of the coronavirus pandemic. However, the estimated airline ad spending is expected to grow by 106% in 2021, according to statista.com (Statista 2022). With one of the world's largest and most competitive aviation markets, the UK aviation sector plays a key role in the UK economy. The Association of UK Airlines suggests that the UK-registered airlines directly contribute £5.2 billion to GDP (Our Statistics 2023). According to the UK Airlines Market Report 2022, the estimated volume of international passengers is around 179.8 million in 2022 (Vries 2022). Consumers are exposed to various types of airline advertising, such as print, billboard, social media, e-mail, and web page ads (Hu and Luo 2016; Kotsi and Valek 2021; Zhang et al. 2014). Visual content facilitates information processing in different visual ad formats (Li and Xie 2020). Previous research has investigated airline advertising effectiveness with participants from China (Zhang et al. 2014), Korea (OH and Park 2020), the United Arab Emirates (Kotsi and Valek 2021), Indonesia (Pramudya, Sudiro, and Sunaryo 2018). France (Kergoat, Meyer, and Merot 2017), Spain (Crespo-Almendros and Del Barrio-García 2016). Research on airline advertising in the UK is limited (Mortimer and Grierson 2010; Neureiter and Matthes 2022).

Mental imagery is defined as 'a processing mode in which multisensory information is represented in gestalt form in working memory' (MacInnis and Price 1987, 473). Mental imagery can facilitate information processing in the absence of actual sensory stimuli (J. Sherman, Mackie, and Driscoll 1990). Therefore, mental imagery processing is essential to the service industry due to its intangibility nature (McDougall and Snetsinger 1990). In the context of automobiles and apparel print advertising, the mental imagery stimulated by the advertising materials provides vivid mental representations of the relevant consumption experience, which leads to positive brand attitudes and behavioral intention (e.g., Fiore and Yu 2001; Laurie and Burns 1997). Previous studies argued that mental imagery is a multidimensional process and may vary in terms of vividness (Marks 1973), quantity (Paivio and Csapo 1973), elaboration (Bone and Ellen 1990), and emotional meaning (Bower 1981). Existing research heavily focused on investigating imagery-evoking techniques in marketing communications, such as the use of pictures (e.g., Babin and Burns 1997; Childers and Houston 1984; Paivio and Foth 1970; Rossiter 1982; Shepard 1967), the use of concrete words (Burns, Biswas, and Babin 1993; Cartwright, Marks, and Durrett 1978; Lutz and Lutz 1978; Paivio 1969; Paivio and Foth 1970), instructions to imagine (Burns, Biswas, and Babin 1993; Carroll 1978; Lao 2013; Rossiter 1982; Wright 1980), the combination of pictures, words, and instructions to imagine (Gavilan, Avello, and Abril 2014; Walters, Sparks, and Herington 2007), and narrative pictures/stories (Hamby, Daniloski, and Brinberg 2015). However, the psychological process differences consumers experience when exposed to different advertising stimuli are unclear. Existing research on the impact of mental imagery in advertising processing produces inconsistent findings (Taylor and Thompson 1982). Bone and Ellen (1990) suggested that ad imagery creates more positive cognitive, emotional, and behavioral responses. However, Smith and Shaffer (2000) showed that adding vivid but incongruent images to a message can undermine message processing. The inconsistent results could be due to the multidimensional nature of the mental imagery. Nevertheless, the relative importance and relationships between different dimensions of mental imagery in enhancing airline ticket purchase intention are unclear.

To bridge the research gaps discussed above, this paper investigates the following research questions:

(1) How does the psychological process differ when consumers are exposed to imagery-evoking and less imagery-evoking airline ads?
(2) What roles do different dimensions of mental imagery play in the airline ads information processing process?

This study primarily contributes to understanding the imagery processing processes under different levels of imagery-evoking airline ads. In this article, we aim to provide alternative explanations of the conflicting findings on the role of imagery vividness in information processing by highlighting the moderating role of the imagery-evoking level and the relative importance of different mental imagery dimensions in airline advertising processing.

Literature review

Airline advertising and information processing

Airline advertising has become an increasingly important tool for airline companies to promote their service and increase sales. Practitioners and scholars have researched the effectiveness of airline advertising to understand better advertising efforts in the customer cognitive, emotional, and behavioral responses (e.g., Kergoat, Meyer, and Merot 2017; Wang, Kao, and Ngamsiriudom 2017; Zhang et al. 2014). Previous studies on airline advertising have explored the effect of social media marketing activities on brand awareness and brand image of airline companies (Seo and Park 2018), corporate image and green advertising claims on brand evaluation and purchase intention (Neureiter and Matthes 2022; Pramudya, Sudiro, and Sunaryo 2018), consumer imagery and brand personality (Hu and Luo 2016; Kotsi and Valek 2021), celebrity endorsement on brand credibility and purchase intention (Wang and Scheinbaum 2018; Wang, Kao, and Ngamsiriudom 2017), and types of advertising messages on brand attitude and evaluation (Kergoat, Meyer, and Merot 2017; Lin et al. 2006; Shiv, Edell Britton, and Payne 2004; Zhang et al. 2014).

Based on a review of previous research in the context of airline advertising (see Table 1 for previous research findings on airline advertising), previous studies focused on the processing of verbal information, such as pricing, service quality, positive and negative message framing, and the influence of celebrities, rather than the imagery processing induced by visual information of airline ads. For example, Hu and Luo (2016) discussed Air Franc's brand positioning in four print ads through semiotic discourse analysis. However, one of the significant disadvantages of semiotic analysis is that it is heavily dependent upon the skill of the individual analyst (Leiss, Kline, and Jhally 1990). Hu and Luo (2016)'s study didn't investigate how ad viewers process the information presented in these print ads. Zhang et al. (2014) suggested that emotional advertising appeals are more effective with experience service, whereas rational advertising messages are more effective with credence service conditions. Nevertheless, Zhang et al. (2014) mainly focused on verbal message processing rather than visual imagery processing in the airline advertising context. Mental imagery processing is crucial for the service industry due to its

Table 1. Literature review summary on airline advertising.

Source	Theories/concepts	Variables examined		Research Context	Methods	Main Results
Theme: Brand Image						
(Seo and Park 2018)	Brand equity	IV:	Social media marketing activity (SMMAs)	South Korean	Survey	SMMAs such as entertainment, interaction, trendiness, customization and perceived risk positively affect brand awareness and brand image; brand awareness and image positively influence e-WOM and commitment; airlines with low awareness could actively pursue SMMAs to increase awareness and develop committed customers.
		Mediator:	Brand awareness; brand image			
		Moderator:	N/A			
		DV:	e-WOM; commitment			
(Pramudya, Sudiro, and Sunaryo 2018)	Corporate image	IV:	Corporate image; brand awareness	Indonesia Flag Carrier Airline	Survey	Customer trust mediates the relationship between corporate image and purchase intention.
		Mediator:	Customer trust			
		Moderator:	N/A			
		DV:	Purchase intention			
(OH and Park 2020)	Advertising model; corporate image and brand loyalty	IV:	Properties of the advertising model (reliability; attractiveness; professionalism)	South Korean	Survey	The social reliability mediates the relationship between reliability and brand loyalty; social reliability mediates the relationship between professionalism and brand loyalty; communication mediates the relationship between reliability and brand loyalty; communication mediates the relationship between professionalism and brand loyalty.
		Mediator:	Corporate image (competitiveness; social reliability; communication)			
		Moderator:	N/A			
		DV:	Brand loyalty			
Theme: brand personality and user imagery						
(Hu and Luo 2016)	Multimodal analysis	IV:	N/A	Air France advertising campaign	Semiotic discourse analysis	Through the construction of an elegant, glamorous and superior atmosphere Air France tends to broadcast their brand toward viewers who pay attention to quality of and enjoyment in life, and welcome prosperous cultural peculiarities.
		Mediator:	N/A			
		Moderator:	N/A			
		DV:	N/A			
(Kotsi and Valek 2021)	Brand personality; marketing funnel	IV:	N/A	UAE	Survey	Etihad Airways and Emirates significantly differ in three (sincerity, excitement, competence) out of five brand personality dimensions.
		Mediator:	N/A			
		Moderator:	N/A			
		DV:	Brand personality			

(*Continued*)

Table 1. (Continued).

Source	Theories/concepts	Variables examined		Research Context	Methods	Main Results
Theme: Celebrity and endorsement						
(Wang, Kao, and Ngamsiriudom 2017)	Source credibility theory; product differentiation theory	IV: Mediator: Moderator: DV:	Consumers' attitude of endorser credibility Brand attitude; brand credibility N/A Purchase intention	Passengers at Taipei Shongshan Airport	Survey	Consumers' attitude of endorser credibility positively influences consumers' attitude and credibility of the endorsed airline brand; consumers' attitude and credibility toward the endorsed airline brand positively influence the purchase intention of the endorsed airline brand.
(Wang and Scheinbaum 2018)	Source credibility theory; product differentiation theory	IV: Mediator: Moderator: DV:	Attractiveness; trustworthiness; expertise Brand credibility; brand attitude Involvement Purchase intention	International airline passengers	Survey	Consumer trustworthiness of a celebrity endorser positively influences brand credibility; the relationship between credibility toward a brand and purchase intention is intensified when the consumer is highly involved; endorser attractiveness and trustworthiness increase attitude and credibility toward the endorsed brand, which leads to purchase intention regardless of involvement.
Theme: Advertising message types						
(Lin et al. 2006)	Elaboration likelihood model; message framing	IV: Mediator: Moderator: DV:	Message framing N/A Involvement; time pressure Ad attitude	International airline passengers	Experiment	Positively framed messages are more effective than negatively framed messages when air travelers are intensively involved in the message under time pressure. Negatively framed messages are more effective when air travelers are intensively involved in the message not under time pressure.
(Shiv, Edell Britton, and Payne 2004)	Cognitive elaboration; message framing	IV: Mediator: Moderator: DV:	Message framing N/A processing motivation; processing opportunity Ad attitude	Students	Experiment	Under low processing motivation condition, negative framing is more (less) effective than positive framing when the level of processing opportunity is low (high). Under high processing motivation condition, negative framing is more effective than positive framing, irrespective of the level of processing opportunity.
(Zhang et al. 2014)	Self-congruity and self-concept; information processing motivation and ability	IV: Mediator: Moderator: DV:	Advertising message appeal Emotional responses Service type; affect intensity Brand trust; brand attitude	China	Experiment	Participants perceive the service to be more trustworthy in the emotional appeal condition than in the rational appeal condition when evaluating experience services (airline), resulting in more favorable brand attitude in the emotional advertising condition; high affect intensity respondents generate more positive emotional and attitudinal responses to the emotional advertising appeal.

(*Continued*)

Table 1. (Continued).

Source	Theories/concepts	Variables examined	Research Context	Methods	Main Results
(Kergoat, Meyer, and Merot 2017)	Cognitive load; information processing	IV: Pictorial claim Mediator: Verbal claim attitude Moderator: Cognitive load; verbal claim type DV: Ad attitude	France	Experiment	The presence of an attractive picture elicited an unfavorable attitude toward the functional verbal claim when recipients were under no cognitive load condition. Participants under cognitive load judged the price less attractive when the picture was present rather than absent whereas the reverse was observed in the no cognitive load condition.
(Neureiter and Matthes 2022)	Schema incongruity processing theory	IV: Green advertising claims Mediator: Perceived greenwashing Moderator: N/A DV: Brand evaluation; flight shame	German	Experiment	Abstract compensation, vague, and false claim have significantly higher levels of perceived greenwashing than the control condition; when topical environmental knowledge was given, concrete compensation was perceived to a stronger degree as greenwashing than when topical environmental knowledge was not given.

intangibility character (McDougall and Snetsinger 1990). Past research explored the role of mental imagery processing in the context of destination advertising rather than airline advertising (Goossens 2000; Lee and Gretzel 2012). Goossens (2000)'s study discussed the importance of mental imagery in destination decision-making. However, the article didn't provide empirical evidence to support relevant propositions. Lee and Gretzel (2012)'s study explored the mediating role of mental imagery processing between website characteristics such as text, picture and sound on vacation destination attitude strength and confidence. Nevertheless, the roles of different mental imagery dimensions in airline ads' visual information processing remain unclear.

Mental imagery processing in advertising

Mental imagery processing is especially pertinent to advertising research because it has been demonstrated to influence cognitive and affective responses to ads' messages (Miller, Hadjimarcou, and Miciak 2000). Consumers can anticipate what consuming a product or having an experience would be like from the evoked mental imagery of the ad (Gavilan, Avello, and Abril 2014). Goossens (2000) suggests that mental imagery may be a key influencer in behavioral intentions on destination selection. Walters et al. (2007) examined how pictures and text in print ads for tourism destinations contribute to holiday decision-making. The pictorial stimuli they tested were a concrete color image, a less concrete color image, and no image. The concrete image was an island-looking scene with sand, water, palm trees, deck chairs, and a blue sky, and the less concrete image only contained parts of the concrete scene: blue sky, part of a palm tree, and deck chairs. Concrete images are considered imagery evoking and facilitate mental imagery processing for ad viewers (Walters, Sparks, and Herington 2007).

Past research provided mixed findings as to how mental imagery influences purchase intention. Mitchell (1986) found that the valence of a photograph in an ad has a strong relationship with the consumer's attitude toward an ad. It is not, however, the only determining factor. Mitchell (1986)'s study suggests that ad attitude can be influenced by other elements of mental imagery, not just the image valence. Miller and Stoica (2004)'s study compared consumer responses to an ad for a fictitious tropical destination containing a photograph versus two artistic renditions of the photograph. The two artistic renditions, one created in Photoshop and the other a watercolor painting, are considered abstract examples. The results found that the abstract examples drew more attention than the photograph. The authors argue this is because of their novelty when positioned next to a photograph. However, the photograph was more successful in evoking mental imagery but did not produce a greater quantity of imagery. The findings of this paper suggest that different dimensions of mental imagery may play different roles in consumers' information processing at different imagery levels.

Previous research on mental imagery processing mainly focused on the positive role of mental imagery on consumers' cognitive, affective, and behavioral responses (Bogicevic et al. 2019; Ha, Huang, and Park 2019). The relative importance of each mental imagery dimension for processing different levels of the imagery-evoking ads remains unclear. Mental imagery has been described as 'thinking pictures' that facilitate mental simulations, which lead to higher accessibility of simulated events and positive change in attitudes, brand evaluation, and actual behavior (Escalas 2004; Lutz and Lutz 1978).

Using pictorial material can evoke the mental imagery processing (Kim, Kim, and Bolls 2014). Airline services are challenging to evaluate in advance but can only be assessed after the experience, making mental imagery a crucial element in airline ad processing.

Multidimensional mental imagery in the information processing

Imagery has been a focus of research, especially in consumer behavior, and has been defined by various authors. Paivio (2013, 135–136) defined imagery as 'a memory code or associative mediator that provides spatially parallel information that can mediate overt responses without necessarily being consciously experienced as a visual image'. MacInnis and Price (1987, 473) defined mental imagery as 'a process (not a structure) by which sensory information is represented in working memory'. Sensory-related dimensions like quantity, modality, vividness, and valence can explain mental imagery. Quantity is the number of images evoked by a stimulus (Miller, Hadjimarcou, and Miciak 2000). Modality is the sensory nature of images, as they can be visual, auditory, gustatory, olfactory, tactile, or a combination of these (Miller, Hadjimarcou, and Miciak 2000). Vividness refers to the images' clarity, intensity, and distinctiveness (MacInnis and Price 1987). Valence is how the emotional meaning is connected to the individual's memories (Miller, Hadjimarcou, and Miciak 2000).

Imagery processing is argued to be based on the nonverbal, concrete sensory representation of ideas, feelings, and memories, which can be extracted directly from previous experience (Chang 2013; Childers, Houston, and Heckler 1985). High imagery stimuli, such as pictorial stimuli, generate greater information elaboration (Gregory, Cialdini, and Carpenter 1982). Pictorial stimuli can be classified according to concreteness, ranging from very concrete and realistic to less concrete and abstract (Babin, Burns, and Biswas 19921992; Percy and Rossiter 1983). In a concrete picture, the subject can be easily identified as a person, place, or object, whereas in an abstract picture, the subject is not readily identifiable (Rossiter 1982). For example, showing a plane flying in the sky reminds consumers about their past traveling experiences compared with a fraction of the aircraft. Visuals can be either high or low in terms of imagery value. High imagery visuals can quickly and easily arouse mental images (i.e., a sensory experience). Imagery value and concreteness are highly correlated, and researchers often use them interchangeably (Marschark and Cornoldi 1991).

However, previous research also provided empirical evidence to suggest that including concrete or imagery-evoking images in marketing communications is not always more effective. Underwood et al. (2001) provided empirical evidence to show that using pictures on product packages can only increase attention and product choice when the experiential benefit of the product is high and when consumers are unfamiliar with the brand. Unnava et al. (1996) found that high visual imagery-evoking ad induces higher information recall when presented in an auditory format. Additionally, ads with higher visual imagery undermine information elaboration when textual information is presented due to limited cognitive resources. The influence of different dimensions of mental imagery and industry context could explain the inconsistent findings. For example, Babin and Burns (1997) found that concrete pictures used in their research (automobile) did not significantly influence the quantity or elaboration (activation of stored information in the production of mental images beyond what was provided by the stimulus) of

mental imagery. Looking at the role of mental imagery in mobile advertising, Gavilan et al. (2014) found that pictures limited the ability of individuals to increase the quantity of imagery evoked, and the word messages were more effective in stimulating imagery. Gavilan et al. (2014) believe that ads with vivid and concrete images do not stimulate much imagery. The individual becomes passive and cannot evoke any other images in their mind except for the image in the ad. These results suggest it is worth investigating how the underlying information processing mechanism differs with different levels of imagery-evoking ads. For example, Elder and Krishna (2022) called for research on how one's current state influences different imagery dimensions formed. As this research focuses on the airline industry's print ads, the imagery dimensions of quantity, vividness, and valence are explored.

Consumers are exposed to unprecedented mediated visual ads in the contemporary digital era (Avgerinou 2009). Research has shown that motivation and ability to process advertising stimuli could affect how viewers process the information and persuasive outcomes (Petty, Cacioppo, and Schumann 1983). In the traditional view, verbal information is linked to systematic processing and visual information is often linked with heuristic processing (Cacioppo et al. 1986). However, some scholars argue that pictorial stimuli may be strong arguments when conveying relevant information in the information-processing process (Lazard and Atkinson 2015; Miniard et al. 1991). High imagery-evoking pictorial stimuli are more attractive, entertaining, and motivating than low imagery-evoking visual stimuli as individuals are in an active information processing mode to make sense of the stimuli (Mayer et al. 2005). However, when examining audience elaboration, previous studies mainly focused on the verbal message element without considering the persuasive effect of pictorial stimuli (Kergoat, Meyer, and Merot 2017; Lazard and Atkinson 2015). For example, by applying the elaboration likelihood model, Lin et al. (2006) provided empirical evidence to suggest that highly involved air travelers under high time pressure tend to apply heuristic processing. Thus, positively framed messages are more persuasive, whereas highly involved air travelers with little time pressure tend to use systematic processing, and negatively framed messages are more compelling. In this article, we would like to explore how different levels of imagery-evoking ads influence the visual information processing of airline advertising via multidimensional mental imagery. Shiv et al. (2004) found that when the level of processing motivation is low, negative framing is more (less) effective than positive framing when the level of processing opportunity is low (high). When the level of processing motivation is high, negative framing is more persuasive than positive framing. It would be interesting to investigate the role of visual information in the heuristic and systemic process.

Conceptual framework and hypothesis development

Imagery processing and elaboration likelihood model

According to the elaboration likelihood model, some scholars argue that the pictorial stimuli act as peripheral cues and affect the formation of attitudes and beliefs about the product and attitude toward the ads, which together can influence brand attitude and purchase intention (Miniard et al. 1991; Mitchell 1986; Yim, Kim, and Lee 2021). Mitchell and Olson (1981) found that people make inferences and develop

beliefs about a brand based on very little information the ad provides using heuristics. For example, they tested an ad for facial tissue featuring a fluffy kitten. Respondents interpreted the fluffy kitten as meaning the facial tissues were very soft. Interestingly, when a product was paired with an abstract painting, respondents had negative product attribute beliefs. However, a pictorial element may be considered a central argument if it contains relevant persuasive meanings. For example, consumers may consider the beauty of cosmetic product models as evidence of product effectiveness (Petty 1995, 195–255). Images can be essential in persuasive messages as they draw attention to the advertisement. Pictorial stimuli can affect attention and consumer engagement in information processing (Pieters and Wedel 2004; Pieters, Wedel, and Batra 2010). Pieters and Wedel (2004) found that the pictorial element within an ad is the most influential in increasing overall attention. Research has also shown that ads are better at getting consumers' attention in color rather than black and white, indicating imagery-evoking visual stimuli can motivate viewers to process the information in a visual ad (Groenhaug, Kvitastein, and Grønmo 1991; Lohse 1997).

Research has suggested that imagery processing creates greater behavioral intentions due to the availability of heuristic (Bone and Ellen 1990; Tversky and Kahneman 1973). Stimuli, such as concreteness and paleness of the image, evoke a higher level of imagery (Babin and Burns 1997; Fennis, Das, and Fransen 2012; Walters, Sparks, and Herington 2007). Mental simulations evoked from imagery-evoking pictorial stimuli motivate consumption behavior because these mental representations involve self-enacting, detailed, consumption, or product-related behaviors (Phillips, Olson, and Baumgartner 1995). Therefore, it is reasonable that if it is easier to stimulate high-quality imagery (vividness), more images (quantity) should also be stimulated. The authors expect the imagery-evoking ad will induce a higher level of mental imagery on all three dimensions than the less imagery-evoking ad. This research focuses on the imagery processing process differences when people are exposed to different levels of imagery-evoking ads.

Imagery is a multidimensional process (Miller, Hadjimarcou, and Miciak 2000). Scholars suggested that imagery may vary in quantity, vividness, and valence (Kieras 1978; Lang 1979; Marks 1973; Yoo and Kim 2014). The vividness of mental imagery concerns the clarity of the mental image an individual evokes in the information processing (Childers, Houston, and Heckler 1985). The quantity dimension of mental imagery is the number of images evoked by a stimulus (Miller, Hadjimarcou, and Miciak 2000).

When the pictorial stimulus contains essential information about the airline services or prospective travel experience, the vividness dimension could be considered as the strength or quality of the message, as vivid stimuli facilitate the development of concrete mental representations and activate relevant products or experience information in memory in the absence of actual sensory stimuli (J. Nisbett and Ross 1983; Sherman, Mackie, and Driscoll 1990). An imagery-evoking ad is more engaging than a less imagery-evoking ad (Mayer et al. 2005). The elaboration likelihood model argues that when people are engaged in a topic and invest the time and effort to process the message, they are more likely to be persuaded through the central route, focusing on the strength of the argument. Therefore, the vividness dimension is more salient in the high imagery-evoking ad processing for ad viewers, and they rely less on the quantity dimension of mental imagery.

Schlosser (2003) argued that the central route and peripheral route processing could occur simultaneously, and the dominance of one over the other can be presented in certain conditions. When people can only obtain relevant consumption information from pictorial stimuli, the vividness of the pictorial stimuli is the primary source for gaining product or service-relevant information, as it is directly linked with previously stored mental representations (Gavilan, Avello, and Abril 2014). Therefore, the vividness dimension of mental imagery is expected to be essential in visual processing, regardless of whether the ad image is imagery-evoking or less imagery-evoking. Miniard et al. (1991) demonstrated that when information processing is more elaborated, the impact of product-relevant elements is more significant, and the impact of the non-product or service-relevant element decreases. On the other hand, no difference was observed when information processing was less elaborated. The vividness dimension provides more detailed product or service-relevant information, whereas the quantity dimension concerns more about the surface features or non-product or service information. This indicates that the vividness dimension is more salient when information processing is more involving or elaborated (e.g., imagery-evoking ads). When information processing is less involved or elaborated (e.g., less imagery-evoking ads), both vividness and quantity dimensions are critical for ad viewers.

Research showed that mental imagery increases consumers' behavioral intentions through a positive emotional response (Gavilan, Avello, and Abril 2014; Yoo and Kim 2014). The valence dimension of mental imagery is defined as an individual's interpretation of the emotional meaning attached to concrete memories (Miller, Hadjimarcou, and Miciak 2000). Based on previous research findings, we argue that the valence of the imagery should mediate the relationship between vividness and purchase intention for both imagery-evoking and less imagery-evoking ads. According to the elaboration likelihood model, the indirect effect between vividness and purchase intention via valence should be greater for the imagery-evoking ad compared with the less imagery-evoking ad due to different levels of message elaboration (Lazard and Atkinson 2015). However, as this research focuses on pictorial-only stimuli, the vividness dimension of mental imagery is an important information source for both imagery-evoking and less imagery-evoking ads (Schlosser 2003). Therefore, we do not expect the indirect effects between the imagery-evoking and the less imagery-evoking ad groups to be significantly different. Hence, the following hypotheses are proposed (see Figure 1 for the conceptual framework):

> **H1:** a) Valence mediates the positive relationship between vividness and purchase intention for both imagery-evoking and less imagery-evoking ads; b) the indirect effect of vividness on purchase intention via valence does not differ between an imagery-evoking and a less imagery-evoking ad.

The quantity dimension of mental imagery also leads to affective and behavioral responses such as positive feelings, attitudes, and behavioral intention (Argyriou 2012; Bone and Ellen 1992; Lee and Qiu 2009). It is reasonable to expect valence to mediate the relationship between quantity and behavioral intention (Steinmann, Kilian, and Brylla 2014). Based on the elaboration likelihood model, when people are less engaged in a topic, they are more likely to be persuaded by peripheral cues. They are more easily influenced by peripheral aspects of the message, such as the numbers and length of the

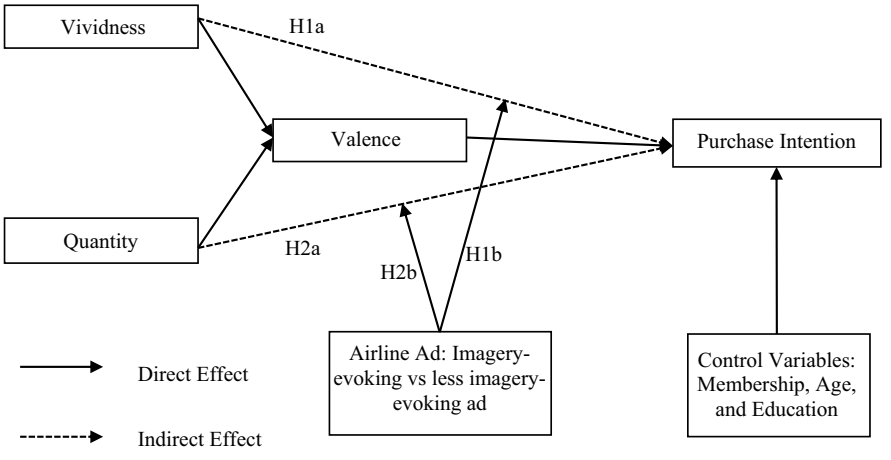

Figure 1. Conceptual Framework.

argument (Petty and Cacioppo 1986). Therefore, ad viewers will also rely on the quantity dimension of mental imagery as heuristic cues when they are exposed to a less imagery-evoking ad. This makes the role of the quantity dimension of mental imagery more salient for the less imagery-evoking than the imagery-evoking ad. Hence, we propose the following hypotheses (see Figure 1 for the conceptual framework):

> **H2:** a) Valence mediates the positive relationship between quantity and purchase intention for the less imagery-evoking ad but not for the imagery-evoking ad; b) the indirect effect of quantity on purchase intention via valence differs between an imagery-evoking and a less imagery-evoking ad.

Methodology

Research design and sampling

Participants aged 18 years or older in the UK are eligible for this study. Participants are invited to complete a scenario experiment survey based on one of the two real ads from the airline industry. Previous studies have adopted a scenario-based data collection approach in the service failure (Grégoire, Tripp, and Legoux 2009; Tsarenko and Strizhakova 2013). Instead of using descriptive scenarios, this research used real ads from airline companies. The two airline ads used in the study were identified from real ads on the Internet based on the definitions of 'imagery-evoking' and 'less imagery-evoking' in the literature (Rossiter 1982; Walters, Sparks, and Herington 2007). The first advertisement (see Figure 2) is from Hawaiian Airlines and is an example of an imagery-evoking image. It features a plane flying over mountains and the ocean during a colorful sunset. The second advertisement (see Figure 3) is from Swiss Air and is an example of a less imagery-evoking image. It is a view from the tarmac with a close-up of the front of the plane on the right and the back of another plane on the left. This image is in grayscale except for a small amount of red.

Figure 2. Imagery-evoking ad.

Figure 3. Less imagery-evoking ad.

The survey was distributed via online advertising via Facebook, LinkedIn, and email. Respondents were randomly assigned to one of the two ad scenarios, and their opinions on the ad were gathered. One group answered questions about the imagery-evoking ad, and a second group answered questions about the less imagery-evoking ad. 246 volunteers completed the online survey ($N_{Imagery\text{-}evoking} = 119$, $N_{Less\ imagery} = 127$).

A survey measuring all of the proposed constructs and demographic questions was developed. Miller et al. (2000) developed a scale to measure mental imagery evoked from the two airline ads, one imagery-evoking and one less imagery-evoking. This scale has been

used in other advertising research, especially in the tourism industry (Lee and Gretzel 2012; Walters, Sparks, and Herington 2007; Weiler et al. 2017). This scale was selected because of the creators' rigorous review of imagery research to determine what dimensions of imagery are relevant to advertising. Miller et al. (2000) reviewed the literature on imagery and concluded that the following sensory-related imagery dimensions are most pertinent to advertising research: quantity, vividness, valence, and modality. Our study removed the modality dimension as the scale is irrelevant to single sensory stimuli. Vividness, quantity, valence, and purchase intention are measured on a seven-point Likert scale. Purchase intention was measured with questions from a scale Spears and Singh (2004) developed.

Respondents were shown the two ads and asked which they preferred or if they had no preference and which they were more likely to purchase a plane ticket from or were unsure. The last section of the questionnaire had them answer a few demographic questions, including their gender, age, education, and flight membership.

Demographics of the respondents

The majority of the respondents were female (78.9%). The age ranged from 18 to 70+ years old. To be more specific, 6.1% were 18–22, 50.4% were 20–39, 17.1% were 55–59, and 7.3% were 70 and above. A majority have a Bachelor's Degree (45.1%), 25.6% have some university/college, 25.6% have a Master's degree, and 3.7% have a doctorate.

Data analysis

Confirmatory factor analysis (CFA) was employed to assess the validity of the measuring items via AMOS 26.0. The authors used AMOS 26.0 MyModMed Plugin to compare the indirect effects' differences between the imagery-evoking and less imagery-evoking ads. Several path models are examined, and model fits are compared to provide the best theoretical model for this study.

Scale validity and reliability

Bartlett's Test of Sphericity and Kaiser-Meyer-Olkin (KMO) index is commonly used for determining sampling adequacy (Hair et al. 2016). A significant Bartlett's Test result ($p < .05$) for the factor analysis is considered appropriate. In this study, both imagery-evoking (<.001) and less imagery-evoking (<.001) groups had a significant Bartlett's Test result. A high KMO value (between 0.8 to 1) indicates a good fit for the factor analysis (Kaiser 1970). In this study, both imagery-evoking (0.871) and less imagery-evoking (0.858) groups had KMO values above 0.8. Harman's single-factor test was performed to address the common method variance issue. The total variance extracted by one factor should not exceed 50% (Podsakoff et al. 2003). The single factor test suggested that for the imagery-evoking group data set, 37.3% variance is explained, and for the less imagery-evoking group data set, 42.1% variance is explained, suggesting there is no problem with common method variance.

A total of 17 scale items were used in this study. The item 'The images that came to mind while I looked at the advertisement were . . . anchored by vague and vivid' was discarded as the modification indices value (30) between the error term of this item and another

independent variable is exceptionally high. Removing this item will significantly improve the measurement model fit measures (Hu and Bentler 1999). The item 'I intend to buy a plane ticket from this airline' was also removed due to low factor loading (0.54 for the imagery-evoking group and 0.75 for the less imagery-evoking group). All validated measurement items are listed in Table 2. The reliability of constructs was examined using composite reliability (CR) as it is a much less biased alternative method to measure the reliability, and a value above 0.75 is desirable (Peterson and Kim 2013). The CR values range from 0.889 to 0.963. Discriminant and convergent validity were tested (see Tables 3 and 4). Average Variance Extracted (AVE) is a measure to assess convergent validity and a value

Table 2. Confirmatory factor analysis for the measurement model.

	Imagery-evoking ad			Less imagery-evoking ad			
Items	Factor loadings	AVE	CR	Factor loadings	AVE	CR	Source
Quantity		0.81	0.928		0.82	0.933	Miller et al., (2000)
While I looked at the advertisement many images came to mind (anchored by strongly disagree to strongly agree)	0.95			0.98			
While I looked at the advertisement a lot of images came to my mind (anchored by strongly disagree to strongly agree)	0.96			0.96			
While I looked at the advertisement, I experienced very few images (anchored by strongly disagree to strongly agree)	0.78			0.77			
Vividness		0.69	0.897		0.78	0.934	
Vivid The images that came to mind while I looked at the advertisement were … (anchored by unclear to clear)	0.8			0.89			
Vivid The images that came to mind while I looked at the advertisement were … (anchored by dull to sharp)	0.83			0.93			
Vivid The images that came to mind while I looked at the advertisement were … (anchored by weak to intense)	0.84			0.82			
Vivid The images that came to mind while I looked at the advertisement were … (anchored by fuzzy to well-defined)	0.84			0.89			
Valence		0.82	0.958		0.84	0.963	
The images that came to mind while I looked at the advertisement were… (anchored by unpleasant to pleasant)	0.8			0.9			
The images that came to mind while I looked at the advertisement were … (anchored by bad to good)	0.93			0.95			
The images that came to mind while I looked at the advertisement were … (anchored by awful to nice)	0.92			0.94			
The images that came to mind while I looked at the advertisement were … (not likable to likable)	0.93			0.92			
The images that came to mind while I looked at the advertisement were … (anchored by negative to positive)	0.94			0.87			
Purchase intention		0.67	0.889		0.79	0.937	Spears & Singh, 2004
I would purchase a plane ticket from this airline (anchored by never to definitely)	0.67			0.79			
My interest in purchasing a plane ticket from this airline is … (very low to very high)	0.69			0.9			
I would buy a plane ticket from this airline (anchored by definitely not to definitely)	0.99			0.94			
I would buy a plane ticket from this airline (anchored by probably not to probably)	0.89			0.91			

Table 3. Validity test for imagery-evoking ad version.

	CR	AVE	MSV	MaxR(H)	Quantity	Vividness	Valence	Purchase Intention
Quantity	0.928	0.813	0.311	0.957	0.901			
Vividness	0.897	0.686	0.311	0.898	0.558***	0.828		
Valence	0.958	0.821	0.254	0.966	0.226*	0.504***	0.906	
Purchase Intention	0.889	0.673	0.123	0.977	0.218*	0.299**	0.350**	**0.82**

Table 4. Validity test for less imagery-evoking ad version.

	CR	AVE	MSV	MaxR(H)	Quantity	Vividness	Valence	Purchase Intention
Quantity	0.933	0.823	0.17	0.971	0.907			
Vividness	0.934	0.78	0.253	0.942	0.413***	0.883		
Valence	0.963	0.839	0.253	0.967	0.358***	0.503***	0.916	
Purchase Intention	0.937	0.789	0.145	0.95	0.334***	0.345***	0.380***	**0.888**

above 0.5 is considered sufficient (Hair et al. 2016). The AVE values for this research range from 0.673 to 0.839. Maximum Shared Squared Variance measures the extent to which the factor is explained by items outside the factor (Fornell and Larcker 1981). Discriminant validity is established when both Maximum Shared Variance (MSV) and Average Shared Squared Variance (ASV) are lower than AVE (Straub and Boudreau 2004). Tables 3 and 4 suggest that all the constructs in this study meet the scale validity and reliability check threshold.

The CFA model fits results indicated that the measurement models for both imagery-evoking and less imagery-evoking groups showed excellent goodness-of-fit indices, according to Hu and Bentler (1999) (see Table 5). The multigroup test suggests no difference between the imagery-evoking and less imagery-evoking groups in the measurements (Gaskin and Lim 2018).

Results

Manipulation check

The Independent Samples T-Test results showed that the imagery-evoking ad induced a higher level of quantity ($M_{Imagery} = 3.94$, $M_{Less\ imagery} = 3.34$, $p < 0.01$), vividness ($M_{Imagery} = 4.22$, $M_{Less\ imagery} = 3.87$, $p = 0.65$), and valence ($M_{Imagery} = 5.98$, $M_{Less\ imagery} = 4.64$, $p < 0.01$) of imagery compared with the less imagery-evoking ad, suggesting participants are able to differentiate these two versions of real ads from a mental imagery perspective.

Table 5. Measurement model fits for imagery-evoking and less imagery-evoking ad versions.

	Imagery-evoking			Less imagery-evoking		
Measure	Estimate	Threshold	Interpretation	Estimate	Threshold	Interpretation
CMIN	120.9	–	–	184.155	–	–
DF	110	–	–	110	–	–
CMIN/DF	1.099	Between 1 and 3	Excellent	1.674	Between 1 and 3	Excellent
CFI	0.994	>0.95	Excellent	0.967	>0.95	Excellent
SRMR	0.065	<0.08	Excellent	0.054	<0.08	Excellent
RMSEA	0.029	<0.06	Excellent	0.073	<0.06	Acceptable
PClose	0.879	>0.05	Excellent	0.025	>0.05	Acceptable

Structural model analysis and hypotheses tests

The study aims to compare the imagery processing process differences between viewers exposed to an imagery-evoking and a less imagery-evoking airline ad and explore the role of different dimensions of mental imagery in airline ad processing. Therefore, path analysis was employed using AMOS 26.0.

The path analysis results are shown in Figures 4 and 5. The model fit measures for both imagery-evoking and less imagery-evoking ads are within the range of the cut-off points, indicating excellent model fit (Hair et al. 2016). The bootstrapping result indicated a significant indirect effect between vividness and purchase intention via valence for the imagery-evoking ad (β = .141, 95%CI [.043, .283], $p < 0.01$). For the less imagery-evoking ad group, the indirect effect between vividness and purchase intention via valence is significant (β = .109, 95%CI [.043, .206], $p < 0.001$). As expected, the indirect effect between quantity and purchase intention via valence is insignificant for the imagery-evoking ad group (β = –.022, 95%CI [–.086, .02], $p > .1$). However, the indirect effect between quantity and purchase intention via valence is significant for the less imagery-evoking ad group (β = .053, 95%CI [.001, .145], $p < 0.05$). Therefore, ***both H1a and H2a are supported***. Additionally, the path model results (see Figure 5) indicate that the direct relationship between quantity and purchase intention is also significant for the less imagery-evoking ad group (β = .126, $p < 0.05$).

To exam the indirect effect differences in the path model between the imagery-evoking ad group and the less imagery-evoking ad group (H1b and H2b), the moderated mediation plugin for AMOS from Gaskin (2016) was employed. This plugin is designed for moderated mediation, testing whether the same indirect effect differs between two

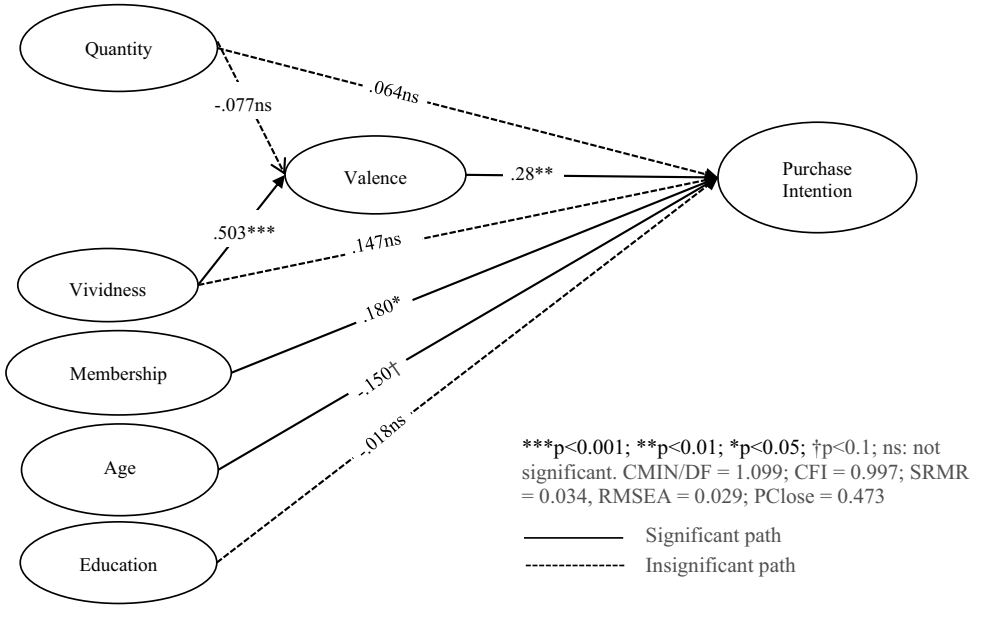

Figure 4. Structural path coefficients for imagery-evoking ad version. Note: ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$; †p < 0.1; ns: not significant. CMIN/DF = 1.099; CFI = 0.997; SRMR = 0.034, RMSEA = 0.029; PClose = 0.473

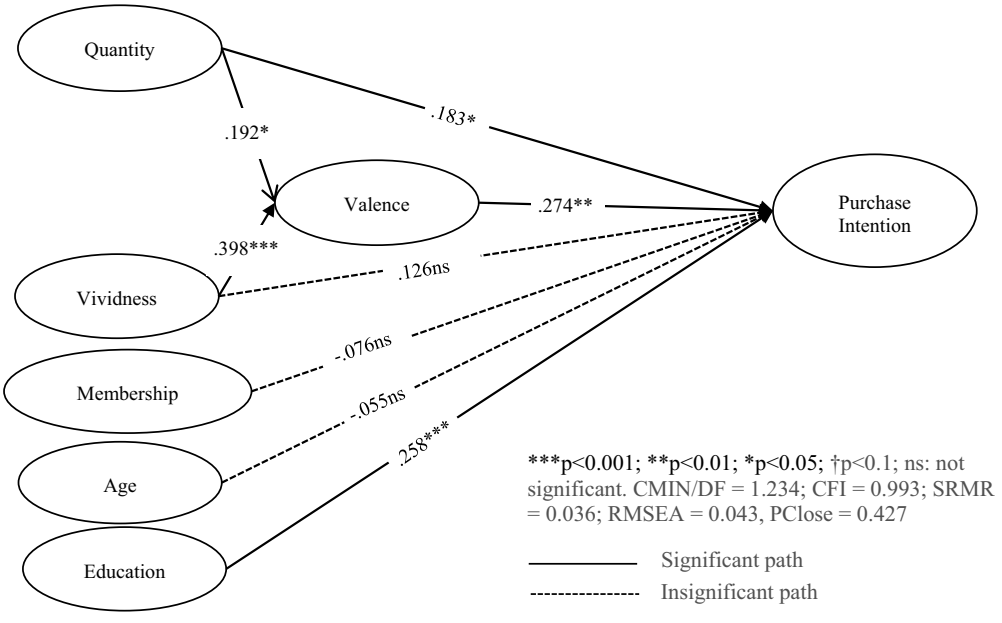

Figure 5. Structural path coefficients for less imagery-evoking ad version. Note: ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$; †$p < 0.1$; ns: not significant. CMIN/DF = 1.234; CFI = 0.993; SRMR = 0.036; RMSEA = 0.043, PClose = 0.427

groups (Gaskin 2016). The bootstrapping results show that the indirect effects between vividness and purchase intention via valence are significant for the imagery-evoking group and the less imagery-evoking group. Nevertheless, there is no significant difference between the indirect effects of these two groups (Indirect effect difference $_{(AxB)\ -\ (CxD)}$)= .016, 95%CI [−.080, .129], p =.693), ***supporting H1b***.

The indirect effect between quantity and purchase intention via valence for the imagery-evoking group significantly differs from the less imagery-evoking group in our study (Indirect effect difference $_{(AxB)\ -\ (CxD)}$) = −0.048, 95%CI [−.122, −.004], p = .034). Based on the bootstrapping results, the indirect effect between quantity and purchase intention via valence for the imagery-evoking group is insignificant, whereas the indirect effect between quantity and purchase intention is significant. The results suggest that quantity plays an essential role in information processing when the less imagery-evoking ad is presented than when the imagery-evoking ad is presented. The results ***support H2b***. Based on the results, all hypotheses are supported in this study.

The path model controlled participants' gender, age, education, travel frequency, airline membership, and ad preference. However, gender, travel frequency, and ad preference are insignificant for both imagery-evoking and less imagery-evoking ad conditions and therefore removed from the path model to achieve the model parsimony. Having a frequent flyer membership from one or more airlines has a positive influence on purchase intention for ad viewers who are exposed to the imagery-evoking ad (β = .180, $p < 0.05$), but not for the less imagery-evoking ad (β = −.076, $p > 0.1$). Membership could be considered an indicator of travel frequency. As mental imagery is associated with people's memory and previous experience (MacInnis and Price 1987), an imagery-evoking ad could easily evoke the stored

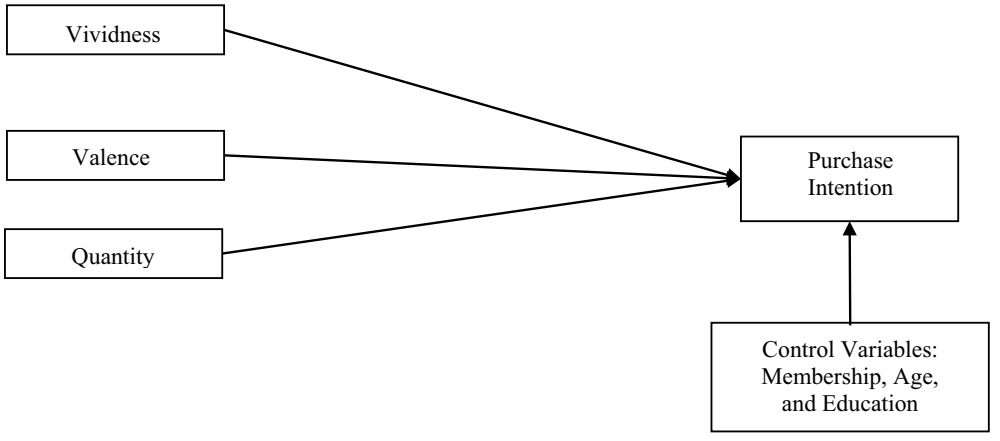

Figure 6. Alternative Model.

experience and memory with ad viewers with more travel experience with different airline companies. Age has a marginally significant negative relationship with purchase intention (β = –.150, $p = 0.077$) for the imagery-evoking ad but not for the less imagery-evoking ad (β = –.055, $p > 0.1$). Our results suggest that younger consumers are more likely to be influenced by the imagery-evoking ad regarding airline ticket purchases. Education has a positive relationship with purchase intention for the less imagery-evoking ad (β = .368, $p < 0.001$) but not for the imagery-evoking ad (β = –.018, $p > 0.1$). Viewers with a higher education level may store more knowledge about the destination, and the less imagery-evoking ad may leave them with more room for imagination.

To provide additional support for the mediating role of valence in the imagery processing process, we also tested the model with vividness, quantity, and valence as independent variables without a mediation relationship (see Figure 6). The model fit indices did not meet the threshold for this model for both imagery-evoking (CMIN/DF = ∞; CFI = 1; SRMR = 0, RMSEA = 0.189; PClose = 0) and less imagery-evoking (CMIN/DF = ∞; CFI = 1; SRMR = 0, RMSEA = 0.198; Pclose = 0) ad versions. The alternative model fit results suggest that the valence dimension of mental imagery serves as a mediator in the airline pictorial ad processing process rather than a parallel independent variable based on the collected data pattern.

Discussions

This study aims to 1) explore the imagery processing process in the context of airline advertising; 2) explore the role of different mental imagery dimensions in the imagery processing process between an imagery-evoking ad and a less imagery-evoking ad. Our findings are consistent with the elaboration likelihood model (Lazard and Atkinson 2015; Petty and Cacioppo 1986). The results indicate that when ad viewers are exposed to an imagery-evoking airline ad, they are more engaged with the central route processing and rely on the vividness dimension of mental imagery for information processing. Valence mediates the relationship between vividness and purchase intention. However, when ad viewers are exposed to a less imagery-evoking airline ad, the central and peripheral routes

processing occur simultaneously (Schlosser 2003). Our findings also suggest that when ad viewers are exposed to pictorial-only airline ads, imagery's vividness, and quantity dimensions play significant roles in influencing purchase intention through valence.

Our study offers an alternative explanation and new insights into airline advertising by examining the moderating role of the level of imagery-evoking stimuli on the underlying imagery processing mechanism. An imagery-evoking ad image does induce a higher level of vividness, quantity, and valence of imagery for ad viewers. However, our research shows it is not just the intensity of different mental imagery dimensions evoked from the pictorial stimuli that matters but also the roles of these dimensions in imagery processing. Our findings suggest that when ad viewers are exposed to an imagery-evoking ad, ad viewers rely on the central route for information processing. They are more likely to pay attention to the vividness dimension of mental imagery. The vividness of mental imagery leads to more positive emotional meanings stored in viewers' memories, further increasing their behavioral intention. Ad viewers are less likely to consider the quantity dimension for information processing when they are exposed to the less imagery-evoking ad.

On the other hand, when ad viewers are exposed to a less imagery-evoking ad, the lack of clarity in the visual stimuli makes viewers rely on mental shortcuts – the quantity dimension of the mental imagery, which further affects purchase intention. Previous research argued that a concrete/vivid image might not increase quantity (Babin and Burns 1997; Gavilan, Avello, and Abril 2014) as giving too many details may prevent viewers from using their imagination. This research revealed that an imagery-evoking image might not necessarily inhibit the number of images evoked in viewers' minds, as previous research suggested (Gavilan, Avello, and Abril 2014). Quantity plays a more critical role in the imagery processing for a less imagery-evoking ad by increasing the purchase intention directly and via valence – the emotional dimension of imagery. Nevertheless, as this research mainly focused on pictorial stimuli, the vividness dimension serves as the main source for the relevant consumption information. The vividness dimension still plays an important role in imagery processing. Our findings suggest that the indirect effect between vividness and purchase intention via valence is lower when processing the less imagery-evoking ad compared with the imagery-evoking ad. However, the difference is not statistically significant.

Our research also revealed interesting findings on some control variables. Ad viewers with frequent flyer memberships are more likely to develop positive emotional and behavioral responses toward the imagery-evoking ad. This finding is consistent with the study from (Petrova and Cialdini 2005). Petrova and Cialdini (2005) found that the use of imagery appeals can increase brand attitudes and purchase intentions for individuals high in dispositional imagery vividness. When product depiction is high in vividness, imagery appeals can increase product preference. Frequent flyers have rich experience in traveling, which means they can easily evoke previously stored information when they process the ad content. Younger people are more likely to be persuaded by imagery-evoking ads. This finding could be explained by the deteriorating imagery processing ability when people get older (Dror and Kosslyn 1994). Interestingly, we found that ad viewers with a higher education level are more immune to imagery-evoking ads and prefer imagery-evoking ads. One possible explanation could be the individual imagery processing ability. Education can influence

mental imagery processing ability (Floridou, Peerdeman, and Schaefer 2022). Travelers with a higher education level may prefer to generate mental images from their own experience rather than rely on the ad information.

Theoretical contributions and practical implications

Previous studies on airline advertising mainly focused on the effectiveness of text messages rather than the non-verbal elements (e.g., Kergoat, Meyer, and Merot 2017; Neureiter and Matthes 2022; Zhang et al. 2014). Our research contributes to the research on the persuasive role of pictorial stimuli in the airline advertising context in the following ways. First, it provides empirical supporting evidence to show that pictorial information may act as central or peripheral cues in the imagery processing process, subject to whether ad viewers are exposed to an imagery-evoking or a less imagery-evoking ad.

Second, previous studies mainly focused on the level or amount of each mental imagery dimension that could be evoked by the advertising content instead of the underlying imagery processing mechanisms (e.g., Bogicevic et al. 2019; Ha, Huang, and Park 2019). Research on the effectiveness of utilizing imagery-evoking ads suggested that vivid stimuli may inhibit ad viewers' ability to generate their own mental representations (Gavilan, Avello, and Abril 2014). Our findings show that apart from the level of each mental imagery dimension, the imagery processing process (the sequence and relative importance of different mental imagery dimensions) is also crucial in influencing ads' effectiveness. This research contributes to the elaboration likelihood model in the airline advertising context by showing that if the pictorial information produces crucial consumption-relevant information (e.g., an imagery-evoking ad), ad viewers are motivated to take the central route processing by focusing on the vividness dimension of mental imagery. On the other hand, if the pictorial information produces limited consumption-relevant information (e.g., a less imagery-evoking ad), ad viewers will pay attention to the surface features, relying on the quantity dimension of mental imagery for information processing. As ad viewers can only gain information from the pictorial element in a pure visual ad, they will consider both vividness and quantity dimensions when exposed to a less imagery-evoking ad.

Third, we were able to show that the central and peripheral processing could occur simultaneously, with one processing dominances the other subject to the level of mental imagery (Schlosser 2003). The indirect effect comparison results show that the vividness dimension is more dominant when processing the imagery-evoking ad. In contrast, the quantity dimension is more salient when processing the less imagery-evoking ad. The path model comparison results suggest that the valence dimension is crucial in the pictorial ad processing context. Our findings indicate that the valence dimension should be treated as a mediator variable rather than a parallel independent variable with vividness and quantity dimensions.

Regarding the managerial implications for practitioners in the airline advertising industry, our research shows that pictorial elements could convey product crucial consumption-relevant information to ad viewers. Airline advertisers do not always have to rely on message appeals or functional information to enhance the effectiveness of the ads. They can utilize pictorial stimuli for storytelling. Providing a concrete or imagery-evoking pictorial ad could motivate the ad viewers to focus on the clarity, intensity, and

distinctiveness of the pictorial message. On the other hand, if advertisers would like to use a less imagery-evoking pictorial ad (e.g., artistic rendering or abstract ad) to showcase the aesthetic value, they may consider designing the ad with more visual elements to increase the mental imagery quantity.

Findings from our control variables also provide some insights into airline companies' advertising design. Our results suggest that younger consumers are more sensitive to the imagery-evoking ad. Therefore, airline advertisers should consider young travelers' interests and preferences regarding visual content design. Our findings also suggest that consumers with a higher educational background may prefer a less imagery-evoking ad version, and airline ads should leave them with more mental space for their own imagination. Ad design with artistic rendering or abstract design might be more appropriate. On the other hand, consumers with frequent flyer memberships are more responsive to the imagery-evoking ad. Providing them with more imagery-evoking ads could increase the purchase intention of airline tickets.

Limitations and future research direction

First, this study adopted two real ads from airline companies instead of an experimental design and asked participants to provide their answers based on these two ads. The scenario-based approach minimizes recall biases. However, this approach has lower internal validity than experimental studies (Tsarenko and Strizhakova 2013). The effect of ad preference was controlled in one of the alternative path models. It was removed from the final path model due to its insignificant relationship with purchase intention and its impact on the degree of freedom of the path model. However, the familiarity of the airline companies may affect consumers' imagery processing process. Future studies could use experiential design to control other effects of the ad design.

Second, the sample contains more female participants than male participants. Future studies should balance the ratio between male and female participants and consider other geographical areas to extend the generalizability of the results.

Third, the Internet has offered chances for multi-sensory advertising. Future research could further explore the influence of other sensory stimuli in airline advertising. Additionally, the content of visual images could convey different types of information. For example, in tourism research, experience economy (i.e., education, entertainment, esthetics, and escapism) may affect consumers' brand attitudes (Hwang and Lee 2019). Future research could explore the role of content types in information processing.

Fourth, the growth of algorithms has made artificial intelligence (AI) and behavioural targeting essential tools for facilitating consumer decision-making (Alnahdi, Ali, and Alkayid 2014; Shin 2022; Shin, Chotiyaputta, and Zaid 2022; Shin, Rasul, and Fotiadis 2022). With the prevalence of information overload in consumers' daily lives, consumers may rely on heuristic cues when they process the information from the ads (Chattalas, Kramer, and Takada 2008). For the travel industry, such as airline and hotel booking sites, most marketers post their ads online and usually adopt behavioural targeting (Alnahdi, Ali, and Alkayid 2014). It would be interesting to investigate the role of AI-driven recommendations on ads' effectiveness in the context of airline advertising and how consumers utilise the heuristic visual cues to simplify their decision-making.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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