Volunteering pro-environmental behavior: The relationships of meaningfulness and emotions in protected areas

Abstract: This investigation focused on the antecedents and impacts on volunteer pro-environmental behavior, and explored the effects of meaningfulness through pride and environmental passion according to the cognitive appraisal theory of emotions. A mixed method research design was used, consisting of interviews, observations, and surveys with volunteers. The research was conducted at Danxia Mountain in Guangdong Province, China, a protected area, UNESCO World Heritage List site, and Geopark. Based on a survey of 302 volunteers, a sequential mediating model was tested through bootstrapping. It was found that perceived volunteering meaningfulness improved sustainable pro-environmental behavior, and pride and environmental passion played sequential mediating roles between meaningfulness and pro-environmental behavior. Compared with pride, environmental passion was the more significant and proximal antecedent of pro-environmental behavior. In addition, awe of the place strengthened the effects of pride and environmental passion on pro-environmental behavior. Theoretical and managerial implications for sustainable development practices in protected areas are outlined.

Keywords: Volunteer; meaningfulness; pride; awe; pro-environmental behavior; protected areas

Introduction

Pro-environmental behavior (PEB) involves actions to protect the environment, reduce resource waste, and care for next generations and ecosystems (Loureiro, Guerreiro, & Han, 2022; Steg, Bolderdijk, Keizer, & Perlaviciute, 2014). It is acknowledged that pro-environmental behavior is a critical antecedent of environmental protection (Gu et al., 2020; Xu, Yang, Wang, Guo, & Shi, 2022; Yusliza et al., 2020), especially in protected areas (Atsız, Ramkissoon, & Öğretmenoğlu, 2022; Esfandiar, Pearce, Dowling, & Goh, 2022). Therefore, how to foster pro-environmental behavior represents a crucial issue for sustainable development. The existing research highlights the effects of place identification and attachment (Atsız et al., 2022; Ramkissoon, Mavondo, & Uysal, 2018; Ramkissoon, Weiler, & Smith, 2012) on resident, employee, and visitor pro-environmental behavior (Udall, de Groot, De Jong, & Shankar, 2021). However, little attention is paid to environmental volunteers.

However, environmental volunteers make significant contributions to environmental protection (Lange & Dewitte, 2022). Therefore, the topic of volunteer pro-environmental behavior should have a prominent standing in the sustainable management literature. Although there is increasing research attention being given to pro-environmental behavior, there are three significant gaps in the literature.

First, empirical research on meaningfulness of pro-environmental behavior is relatively limited. Evidence shows that pro-environmental behavior is driven by intrinsic motivations (De Roeck K, 2018; Masson & Otto, 2021; Olsen, Vogt, & Andereck, 2018), including identification with groups, communities or organizations (Jans, 2021), and individual fulfillment and altruism (Olsen et al., 2018). However, little attention is paid to the effect of meaningfulness at work, which nevertheless is a critical intrinsic motivation for volunteering (Alfes, Antunes, & Shantz, 2017; Im & Chung, 2018). Volunteering meaningfulness is an experience that contributes to self-achievement and the realization of the broader purposes of voluntary work (Steger, Dik, & Duffy, 2012). Work meaningfulness is a significant psychological resource for individuals to express and invest themselves in their roles (Albrecht, Bocks, Dalton, Lorigan, & Smith, 2022; Barrick, Mount, & Li, 2013) . Previous studies have shown that meaningfulness is an intrinsic motivator of individual behavior (Allan, Batz-Barbarich, Sterling, & Tay, 2019), and volunteer pro-environmental behavior especially depends on meaningfulness. Therefore, this research focused on the influence of volunteering meaningfulness on pro-environmental behavior.

Second, the psychological processes through which volunteering meaningfulness affect individual pro-environmental behavior remain unclear. Based on the cognitive appraisal theory of emotions, individual perceptions of work can affect attitudes and behavior through emotions (Ng, Yam, & Aguinis, 2019). There is considerable evidence showing that emotional identification and attachment promote individual pro-environmental behavior (Daryanto & Song, 2021; Lange & Dewitte, 2020; Ramkissoon, Smith, & Weiler, 2013). However, the literature does not provide insight on the complex emotions associated with groups and work. This research focuses on two emotional factors for volunteering meaningfulness that affect pro-environmental behavior: pride and environmental passion. Pride refers to the self-satisfaction and respect experienced by individuals as group members (Ng et al., 2019). Pride is an individual positive emotion within volunteering organizations, and may transfer the effects of meaningfulness to pro-environmental behavior. Individuals gain self-esteem and sense of value by identifying with the groups to which they belong. As a positive emotion, pride can make individuals think more and help them actively participate in activities (Moors, Ellsworth,

Scherer, & Frijda, 2013). Environmental passion comprised of intrinsic pleasure and happiness with volunteering work may affect pro-environmental behavior (Hartmann, Eisend, Apaolaza, & D'Souza, 2017; Robertson & Barling, 2013). Environmental passion can make individuals think more and help them actively participate in activities and share experiences (Junot, Paquet, & Martin-Krumm, 2017). Current research usually considers the mediating role of pride (Jans, 2021) or environmental passion (Peng, Chen, Zou, & Nie, 2021) separately, but there are more complex associations between pride and environmental passion.

Third, the boundary conditions of pride and environmental passion are still under-investigated (Bissing-Olson, Fielding, & Iyer, 2016; Junot et al., 2017). Individual emotions attached to a place are important (Martin et al., 2020), including the awe of a place (Piff, Dietze, Feinberg, Stancato, & Keltner, 2015). As for volunteers, the association with the place is a significant driver and different from motivations based on work or groups (Lange & Dewitte, 2020). Awe is a special and self-transcendent emotion generated by individual perceptions of vastness and power (Li et al., 2019; Stellar et al., 2017). Generally, awe leads to specific behavioral intentions through special experiences (Atsız et al., 2022; Bonner & Friedman, 2011; Yang, Hu, Jing, & Nguyen, 2018). In scenic landscape areas, awe of the place can generate spiritual pleasure and promote pro-environmental behavior (Piff et al., 2015; Zelenski & Desrochers, 2021; Zhao, Zhang, Xu, Lu, & He, 2018). Furthermore, compared with the positive emotions raised by groups or work, awe of a place is triggered by a vast range of stimuli that exceeds ordinariness, and is a psychological base for daily experiences (Perlin & Li, 2020). Awe promotes individual perception by expanding internal models and building resources (Keltner & Haidt, 2003). Thus, people with a sense of awe are more likely to shift attention away from immediate concerns about self-interests and focus on long-term goals and collective purpose (Li et al., 2019). Consequently, this research explored the boundary conditions of pride and environmental passion through exploring the moderating effects of awe.

This research aimed to fill these research gaps by investigating the influence of volunteering meaningfulness on pro-environmental behavior. There are three potential theoretical contributions. First, the impact of voluntary meaningfulness on pro-environmental behavior is examined, which expands the literature of this intrinsic motivator on pro-environmental behavior. Second, based on the cognitive appraisal theory of emotions, the emotional aspects of voluntary meaningfulness and their effects on pro-environmental behavior are analyzed, enriching the research on emotions. Third, the moderating effects of awe are tested and the emotional boundary conditions of pride and environmental passion are examined. The theoretical model is shown as Figure 1.

The article is structured as follows. In the next section, the current literature is reviewed on volunteering meaningfulness, pride, environmental passion and awe, and the relationships among key variables are explained. The third section describes the research design and method, followed by the results. The next sections explain the conclusions and theoretical and practical implications. Then, limitations of the study and future research directions are stated.

[Insert Figure 1]

Literature review and hypotheses

Volunteering meaningfulness and pro-environmental behavior

Meaningfulness refers to the perceived significance, value, and meaning in work (Frieder, Wang, & Oh, 2017). Volunteering meaningfulness is the experience and perception of the importance and value of voluntary work (Im & Chung, 2018; Steger et al., 2012). Based on the meaningfulness literature, volunteering meaningfulness comprises three aspects. First, the psychological meaning of voluntary work is an individual perception of meaning and value (Schutte, Searle, Meade, & Dark, 2012). Second, meaningfulness emphasizes meaning making, implying that life is more meaningful because individuals broaden their understandings and promote growth through interactions with the world (Lin, Koopmann, & Wang, 2020). Third, meaningfulness refers to positive impacts on others, and people believing that their behaviors will have beneficial impacts on community and society (Kubiak, 2020; Tims, Derks, & Bakker, 2016). Accordingly, engaging in voluntary work can satisfy the psychological needs for self-achievement and importance (Bailey, Yeoman, Madden, Thompson, & Kerridge, 2018).

Pro-environmental behavior refers to individual behaviors that promote nature protection and reduce negative impacts on the environment, so as to realize the sustainable development of nature and society (Adams, Hurst, & Sintov, 2020; Bissing-Olson et al., 2016; Steg et al., 2014). Pro-environmental behavior in protected areas encompasses the recycling of resources, advocating an environmentally friendly lifestyle, participating in environmental protection actions, and showing profound humanistic implications (Ramkissoon et al., 2013).

Volunteering meaningfulness may promote pro-environmental behavior and represents intrinsic motivation, an important antecedent driving individual behavior (Allan et al., 2019). Evidence shows that meaningfulness usually leads to positive outcomes including engagement, creativity and other positive attitudes or behaviors (Hu & Hirsh, 2017). Volunteering meaningfulness satisfies psychological needs of being valuable and significant, self-identification and self-growth, and the need for friendliness to influence others (Kubiak, 2020).

Research shows that the perceived significance and values of voluntary work promote individual green behavior of protecting the environment (Supanti & Butcher, 2019), and reducing resource waste (Luu, 2020). Therefore, it was hypothesized that:

H_1: *Meaningfulness is positively related with pro-environmental behavior.*

Mediating effect of pride

Pride refers to the individual identification with a group, degree of pleasure and self-esteem experienced in membership, and the evaluation of group values (Ng et al., 2019). Meaningfulness in voluntary work may enhance pride. The self-realization of satisfaction from volunteering, serving others and belonging to groups are conducive to promoting the identification of group norms, happiness and self-esteem as a group member. Pride is a perspective that may improve pro-environmental behavior from the bottom up (Jans, 2021). A rich body of research demonstrates that pride is a psychological factor impacting pro-environmental behavior (Adams et al., 2020; Bissing-Olson et al., 2016; Shipley & van Riper, 2022a). It is believed that the pride positive emotion plays a strong moral guidance role in enhancing pro-environmental behavior.

Furthermore, volunteering meaningfulness affects pro-environmental behavior through pride. Based on cognitive appraisal theory of emotions, evaluation is a necessary antecedent of emotion generation, and emotional response consequently affects individual attitudes and behavior (Choi, Sung, Lee, & Cho, 2011). Emotion plays a mediating role between cognition and individual attitudes or behavior, which is the core perspective of the cognitive appraisal theory of emotions (Ng et al., 2019). The meaningfulness of voluntary work including perceived value, meaning creation and friendliness, can arouse pride which makes individuals think more and drives them to actively participate in activities (Moors et al., 2013), thus promoting pro-environmental behavior (Cheema, Afsar, & Javed, 2020; Whitmarsh & O'Neill, 2010). Therefore, it was proposed that:

H_2: *Pride mediates the effect of volunteering meaningfulness on pro-environmental behavior.*

Mediating effect of environmental passion

Individual emotions such as perceived happiness, pleasure and satisfaction play significant roles in pro-environmental behavior (Hartmann et al., 2017). Environmental passions are

strong emotions that for people wanting to participate in environmental protection activities, emphasize perceived happiness, pleasure and satisfaction for protecting the environment (Robertson & Barling, 2013). Research shows that those with long-term environmental commitments and enthusiasm for the natural world are more likely to be devoted to protecting the environment and consider environmental well-being in their actions (Davis, Le, & Coy, 2011). In addition, individuals showing emotions toward the environment tend to engage in environmental protection (DiEnno & Thompson, 2013).

The passion for participating in environmental behavior is characterized as happiness and pleasure of experience, and is affected by context cognition. The experience and understanding of volunteer work is an influencing context for pro-environmental behavior. The meaningfulness of voluntary work is a significant personal driver in creating transcendental experiences and cultivating strong enthusiasm in the process of volunteer work. When people perceive value and happiness in volunteer work, they tend to be more engaged and enthusiastic (Afsar, Badir, & Kiani, 2016). Furthermore, volunteering meaningfulness may affect pro-environmental behavior through environmental passion. Based on the cognitive appraisal theory of emotions, volunteering meaningfulness is not only conducive to arousing positive emotions for the organization or group, but also fosters perceived happiness, pleasure and satisfaction at work. Experience of happiness, pleasure and satisfaction are sustainable motivators of pro-environmental behavior. Thus, based on the theory and interviews conducted, it was proposed that:

H_3: *Environmental passion mediates the effect of meaningfulness on pro-environmental behavior.*

Sequential mediating effects of pride and environmental passion

Volunteering meaningfulness may affect pro-environmental behavior through pride and environmental passion. Based on the cognitive appraisal theory of emotions, volunteering meaningfulness impacts behavior through positive emotions (Schutte et al., 2012). Pride and environmental passion are critical emotions aroused by volunteering meaningfulness. Compared with the pride with groups, personal emotions such as perceived happiness, pleasure and satisfaction play a more direct role in pro-environmental behavior (Hartmann et al., 2017). As a positive emotion, environmental passion is positively related to pride (Afsar et al., 2016), while individual pride in groups may lead to environmental passion (Whitmarsh & O'Neill, 2010).

In addition, pride is motivated by the meaningfulness of volunteering. According to social identity theory, identification and pride with groups come from social roles, and work meaningfulness is positively related to specific social roles (Steger et al., 2012). Volunteering meaningfulness reflects the specific work meaning and role. With the impact of volunteering meaningfulness, people define themselves and have specific feelings for the group to which they belong. Furthermore, when individuals perceive significance and value in volunteer work, they are intent on feeling value and importance in a group, which arouse strong passion for protecting the environment. Therefore, the greater people perceive the significance and value of volunteering work, the more likely they will identify with the group and experience passion, enhancing pro-environmental behavior (Murnieks, Mosakowski, & Cardon, 2012). Therefore, it was proposed that:

H_4: *Pride and environmental passion have sequential mediating effects in the relationship between meaningfulness of voluntary work and pro-environmental behavior.*

Moderating effects of awe

Awe is an emotion produced by the individual perception of vastness that overwhelm current mental structures (Shiota, Keltner, & Mossman, 2007). The factors that make individuals feel beyond current experiences in physical, social and cognitive terms are closely related to power (Bonner & Friedman, 2011; Li, Dou, Wang, & Nie, 2019). Awe is an emotional response to an unspeakable understanding, surprise, admiration, and inspiration (Stellar et al., 2017), and is related to psychological experience (Anderson, Monroy, & Keltner, 2018). When great stimuli overwhelm knowledge and current mental structures, individuals are inclined to feel a smallness of self and have the motivation to be kind to others (Perlin & Li, 2020; Piff et al., 2015). Therefore, as the wonder with a place, awe can be an emotional boundary that impacts the effects of pride and environmental passion aroused by a group or work (Li et al., 2019) .

Awe representing emotions about a place means that people admire natural wonders, panoramas or beautiful art, and show specific cognitive and behavioral tendencies (Piff et al., 2015). Awe makes individuals pay attention to broader and marvelous things, and their self-consciousness is weakened (Coghlan, Buckley, & Weaver, 2012). Therefore, individuals are more willing to integrate into social groups and participate in collective actions (Keltner & Haidt, 2003). Collective cooperation and joint actions need people to pay less attention to self-interests and turn to the larger entities to which they belong (such as groups, society and mankind). Therefore, awe can make individuals pay attention to the environment, expand in-

depth processing of individual perceptions and information, bring spiritual pleasure, and promote pro-environmental behavior (Liu, Geng, Ye, & Zhou, 2019; Wang, Zhang, Shi, Lu, & Song, 2019). Awe might increase perceptions that people have abundant resources and tend to focus on long-term goals and collective benefits (Li et al., 2019). Thus, the higher the degree of awe, the more significant the impact of pride and environmental passion on pro-environmental behavior.

On the contrary, if the level of awe for a place is lower, it will weaken the pleasure and satisfaction experienced, strengthen self-awareness, pay more attention to self and interests, and reduce attention to the environment. With a lower degree of awe, the impacts of pride and environmental passion on pro-environmental behavior are weakened. Therefore, it was proposed that:

H_{5a}: *Awe positively moderates the positive effect of pride on pro-environmental behavior. That is, awe strengthens the influence of pride on pro-environmental behavior.*

H_{5b}: *Awe positively moderates the positive impact of environmental passion on pro-environmental behavior. That is, awe strengthens the influence of environmental passion on pro-environmental behavior.*

Research design

Location and sample of respondents

Danxia Mountain UNESCO World Heritage List site and UNESCO Geopark in Guangdong Province, China was the research site. Danxia Mountain has been classified as an important protected area because of its unique Danxia landform. Danxia Mountain science popularization volunteers from the World Heritage site were selected for participatory observation and in-depth interviews. Respondent selection was accomplished through snowball and convenience sampling.

The selection of science popularization volunteers from Danxia Mountain as the respondents was based on the following reasons. First, World Heritage listed sites and geoparks have unparalleled cultural and natural landscapes, which are rare and fragile and need to be cherished and protected. Therefore, they are significant contexts for science popularization volunteering activities and pro-environmental behavior. Science popularization involves science educational activities that make scientific knowledge understandable and accessible for the public (Scharrer, Rupieper, Stadtler, & Bromme, 2017). Science popularization volunteers

are individuals who contribute their time and energy to promote science education that emphasizes pro-environmental behavior. One of their important missions is to provide science popularization services without reward. Science popularization services need specific professional knowledge, such as about geological landforms, geography, animals and plants, astronomy, history, and other natural and humanistic factors. Third, Danxia Mountain popular science volunteer training camp has been staged for eight years (from 2014 to present), has a stable science volunteer team, and has become the benchmark for World Heritage science volunteering training camps.

A mixed-method research design was implemented. Participatory observation and in-depth interviews were conducted at Danxia Mountain science popularization volunteer training camp in 2021 from July 2, 2021 to August 2, 2021. Three observers from the research team were present at this science popularization volunteer training camp, including one with a doctorate and two masters students. The aim of the observations was to view first-hand the attitudes, behaviors, and presentations of science popularization volunteers to provide qualitative evidence for hypotheses development and questionnaire design. Participatory observation was conducted on 26 science popularization volunteers, and in-depth interviews were conducted with eight senior volunteers. The times of in-depth interview ranged from 60 to 90 minutes. Based on the participatory observation and in-depth interviews, an anonymous questionnaire survey was conducted from August 8 to August 15, 2021, and a total of 324 questionnaires were collected. Some 22 invalid questionnaires were not used and 302 valid questionnaires were finally obtained. The effective response rate was 93.2%.

Among the respondents, there were 119 men (39.4%) and 183 women (60.6%). Besides one under 18, some 207 were aged 18-30, accounting for 68.5%, 31-40 and 41-50 were 37 (12.3%) and 28 (9.3%) respectively, and 29 respondents were over 50 (9.6%). Some 26 were without bachelor's degree (8.6%), bachelor's degree holders were 179 (59.3%), and there were 79 (26.2%) masters and 18 (6%) doctors. There were 140 full-time students (46.4%) and 76 teachers (25.2%). Some 150 persons were participating in science popularization volunteer work for the first time (49.7%), and 152 (50.3%) had participated before.

Questionnaire design and measures

This research used five-point Likert scales to measure previously validated constructs, so as to ensure the reliability and validity of scales. In addition, volunteering meaningfulness, pride and awe scales were modified to fit the volunteering context of this research based on observations and interviews. In addition, anonymous questionnaire design and random items alleviated

common method bias.

Volunteering meaningfulness was assessed according to the research of Steger et al. (2012). There were six items, and representative items were as follows: “I have a good sense of what makes my volunteer job meaningful” and “My volunteer work helps me make sense of the world around me”.

The measurement of pride followed Ng et al. (2019); Shen and Benson (2016), with four items. Representative questions were, “I would feel proud to identify myself personally with this volunteer organization”, “I would be proud to be part of this volunteer organization”.

The measurement of the environmental passion scale was from Robertson and Barling (2013) with ten items. Representative items included, “I enthusiastically discuss environmental issues with others”, and “I get pleasure from taking care of the environment”.

The measurement of awe mainly came from the research of Coghlan et al. (2012). After adjusting the situation to science popularization volunteers, there were eight items in total. Representative items included, “I feel surprised” and “I feel reverent”. The measurement of pro-environmental behavior followed Robertson and Barling (2013). There were seven items, including basic pro-environmental behaviors including, “try to reduce the use of supplies and materials” and “recycle materials that can be recycled”. In addition, there were four advanced pro-environmental behaviors, including “find ways of working that are better for the environment”, and “offer ideas for reducing our impact on the environment”.

Results

Validity and reliability

SPSS. 22 was applied to test reliability of variables. Meaningfulness of voluntary work, pride, environmental passion, awe and pro-environmental behavior had good reliability, with Cronbach's α of 0.921, 0.959, 0.944, 0.944 and 0.938, respectively.

Lisrel 8.8 was used for CFA (confirmatory factor analysis). The results showed that a five-factor model had the best fit and the variables had significant discriminant validity (Table1：$\chi^2/df = 3.77 < 5$; NFI = 0.96; NNFI = 0.96; CFI = 0.97; IFI = 0.97; RMSEA = 0.096 < 1). In addition, common method bias was tested through CFA. The single-factor model showed that the model fit was not significant (Table1：NFI = 0.80; NNFI = 0.80; CFI = 0.81; IFI = 0.81; RMSEA = 0.224). Comparing the five-factor and single-factor models, $\Delta\chi^2$ (Δdf) = 692.62, there was a significant difference, and common method bias did not pose a serious threat in this research.

[Insert Table 1]

Correlation analysis

The Pearson correlation relationship analysis results are shown in Table 2. All the key variables showed positive correlation relationships. The diagonal (bolded) values are the AVEs (average variances extracted) of each variable, and all AVEs were over 0.5. The results indicated that all key variables had good convergent validity. In addition, the AVEs were greater than the squares of the correlations, thus those variables showed acceptable discriminant validity.

[Insert Table 2]

Regression analysis

SPSS. 22 Process3.3 was applied to test the hypotheses. Controlling for the demographic variables of age, gender, education level and times of participating in science popularization volunteering, there was a positive relationship between volunteering meaningfulness and pro-environmental behavior (M4: b = 0.56, < 0.001) and H_1 was supported. As shown in Table 3, volunteering meaningfulness was positively related with pride (M3: b = 0.64, $p < 0.001$). Pride was positively related with pro-environmental behavior (M2: b = 0.52, $p < 0.001$), while the relationship coefficient b between volunteering meaningfulness and pro-environmental behavior decreased from 0.64 ($p < 0.001$) to 0.30 ($p < 0.001$). This indicated that pride plays a mediating role between volunteering meaningfulness and pro-environmental behavior. Similarly, after controlling for demographic variables, volunteering meaningfulness and pride, environmental passion was positively related with pro-environmental behavior (M3: b = 0.84, $p < 0.001$), while the relationship coefficient b between volunteering meaningfulness and pro-environmental behavior decreased from 0.30 ($p < 0.001$) to 0.03 (NS), The relationship coefficient b between pride and pro-environmental behavior decreased from 0.52 ($p < 0.001$) to 0.00 (NS), indicating that the impacts of meaningfulness and pride on pro-environmental behavior were mediated by environmental passion.

A bootstrapping test was conducted through SPSS22.0 Process3.3 to test the sequential mediating effects of pride and environmental passion, with 5,000 random samples and a 95% confidence interval [CI]. The results showed the total effects of volunteering meaningfulness on pro-environmental behavior were 0.56, with 95% CI [0.00, 0.45]. The indirect effect of pride was 0.00, with 95% CI [-0.11, 0.10]. The indirect effect of environmental passion was 0.25, with 95% CI [0.14，0.39]. The sequential mediating effects of pride and environmental

passion were 0.28, with 95% CI [0.19, 0.37]. Pride and environmental passion had significant mediating effects between volunteering meaningfulness and pro-environmental behavior. H_3 and H_4 were supported, and H_2 was not supported.

[Insert Table 3]

The moderating effects of awe are presented in Table 4. After controlling the demographic variables, awe was positively associated with pro-environmental behavior (M5：b = 0.22, $p < 0.01$), as well as the interactive effects of awe and pride (M5：b = 0.31, $p < 0.01$).Therefore, awe of the place strengthened the impact of pride on pro-environmental behavior.

[Insert Table 4]

SPSS22.0 Process3.3 was applied to test the moderating effects, with 5,000 times random repeated sampling and a 95% CI Bootstrap. The results showed that under a low-level awe condition, the effect of pride on pro-environmental behavior was 0.18 (SE of 0.06), with 95% CI [0.04, 0.29]. Under a medium level awe condition, the effect of pride on pro-environmental behavior was 0.29 (SE of 0.06), 95% CI [0.18, 0.40]. Under high-level awe, the effect of pride on pro-environmental behavior was 0.38 (SE of 0.07), 95% CI [0.26, 0.52]. Therefore, the moderating effect of awe was significant between pride and pro-environmental behavior, and H_{5a} was supported. The moderating effect of awe on the relationship between pride and pro-environmental behavior is shown in Figure 2.

[Insert Figure 2]

The interactive effect of awe and environmental passion were positively related to pro-environmental behavior (M6: B = 0.15, $p < 0.05$). This means that awe of place strengthened the positive impact of environmental passion on pro-environmental behavior. Furthermore, to test the moderating effect of awe on environmental passion and pro-environmental behavior, a Bootstrap test by SPSS 22.0 Process3.3 was conducted. The random repeated sampling was 5,000 times, and the confidence interval (CI) was 95%. The results showed that under a low level of awe, the effect of environmental passion on pro-environmental behavior was 0.48 (SE of 0.06), 95% CI [0.35, 0.60]. Under medium-level awe, the effect of environmental passion on pro-environmental behavior was 0.53 (SE of 0.06), 95% CI [0.43, 0.65]. Under a high level, the effect of environmental passion on pro-environmental behavior was 0.58 (SE of 0.07), 95% CI [0.46, 0.71]. Therefore, awe strengthened the positive impact of environmental passion on pro-environmental behavior, and H_{5b} was supported as shown in Figure 3.

[Insert Figure 3]

Discussion

Pro-environmental behavior is crucial to achieving protected area sustainable development, especially for volunteers. This research focused on how to facilitate volunteer pro-environmental behavior in protected areas. It examined how rational conditions of volunteering meaningfulness promote pro-environmental behavior through emotions including pride and environmental passion. In addition, the emotional boundary of awe was explored and its influence on the relationships among pride, environmental passion and pro-environmental behavior. Participant interviews and observations were used to inform the conclusions of the quantitative component of this research. The main conclusions with qualitative evidence were as follows.

First, volunteering meaningfulness is a significant intrinsic antecedent affecting pro-environmental behavior. When volunteers feel stronger meaningfulness attached to volunteering work, they are more likely to protect the environment and save resources. Meaningfulness is a key intrinsic motivation of individual outcomes (Han, Sung, & Suh, 2021; Kahn, 1990; May, Gilson, & Harter, 2004). Meaningfulness represents a congruence between work activities and the self. It emphasizes the intrinsic value based on individual rather than intrinsic reasons for required behaviors. Therefore, it could provide self-concordance and boost behavioral involvement (Montani, Boudrias, & Pigeon, 2020). As one interviewed volunteer mentioned, "*my feeling is that science popularization volunteering work can make more people understand environmental knowledge and help others. It is meaningful in itself. As long as there is a chance, I will continue to do it*" (Jin, volunteer, male).

Second, meaningfulness affects environmental passion and consequently impacts pro-environmental behavior. This supports the argument that meaningfulness fosters positive affect and alleviates negative affect (Schutte et al., 2012). Furthermore, it provides evidence that meaningfulness fires environmental passion, and supports the positive effects of meaningfulness on individual outcomes (Bailey et al., 2018). In this process, environmental passion has a direct and strong impact on pro-environmental behavior. As a respondent stated, "*science popularization voluntary work needs long-term persistence, and there will be achievements. Through us (volunteer) efforts, children establish values and beliefs of protecting nature and cherishing resources from an early age. People on the earth are not masters, but nature is. This is very important. I did more presentations, and more children learned about the earth where they live. Actually, the communication with them is very interesting and I feel achievement*".

Through science publicity, it is hoped that people will be convinced to love nature and

influence others, (tell these ideas) to their family, friends around them. A single spark can start a prairie fire. One person's strength is limited, and the passion of volunteers also needs to be transmitted. I always think nature is very interesting. I feel very happy when I explore nature. No matter where I am, I will do it as long as possible. Even if I go abroad, I will do it and protect the earth, and convey the beliefs of science popularization" (Chen, volunteer, male)

"*Danxia Mountain is a 5A scenic area. If I didn't participate in science popularization voluntary work, I would not come here even if it were the 5A scenic spot because it's far from my home. But when I study Danxia Mountain and come to Danxia Mountain, I have a special feeling about her. I will proudly recommend Danxia Mountain to my relatives and friends, send photos in the WeChat group. Then they will ask me questions and this lets me have more motivation to explain greater knowledge about Danxia Mountain to them*" (Jin, volunteer, male).

Compared with environmental passion, the mediating effect of pride was not significant. Existing literature points out that organizational pride plays a mediating role in improving pro-environmental behavior. It was proposed that feelings of pride are positively related to individual pro-environmental behavior (Bissing-Olson et al., 2016; Shipley & Van Riper, 2022b). Some researchers suggest that environmental passion improves pro-environmental behavior (Afsar et al., 2016; Robertson & Barling, 2013). However, the existing literature focuses on pride or environmental passion separately. This research examined the dual mediating roles of pride and environmental passion and revealed that environmental passion had a more significant impact on pro-environmental behavior than pride. According to the literature and interviews with volunteers, it was found that meaningfulness of voluntary work affected individual behavior through intrinsic passion characterized as satisfaction, pleasure and happiness from the activity (Afsar et al., 2016). The impact of pride in the group was relatively weak, as mentioned by the respondents "*I went to several middle schools in Beijing to give presentations, and the students' knowledge levels exceeded my imagination. Children in big cities usually have a broader horizon. When I share geographic knowledge, they are very interested, ask questions and interact with me. They asked a lot of questions, which encourages me to think twice. I will feel achievement. In addition, the communication process was very happy, so I really enjoyed it and will do it next time*" (Chen, volunteer, male).

"*Danxia Mountain is a 5A scenic area. However, many people don't know where Danxia Mountain is. I recommended Danxia Mountain to others, which is a simple popularization of science activity. At a deeper level, it should bring profound meanings. It should represent a sense of mission. That is, we should not only promote the popularization of science projects,*

but also promote scientific knowledge, as well as our understanding of environmental protection, and the construction of ecological civilization values.

I can learn a lot in Danxia Mountain. Because Guangdong Province is the forefront of China's reform, and Danxia Mountain is also advantaged in its location and region. There are many advanced wisdoms here (Danxia Mountain). Many of our popular science volunteer activities are practiced in Danxia Mountain, and then promoted in the mainland." (Huo, volunteer, male)

The awe of the place strengthens the positive effect of pride and environmental passion on pro-environmental behavior. Pride and environmental passion can improve individual pro-environmental behavior, and the results are in line with existing research (Lange & Dewitte, 2020). Furthermore, besides pride and environmental passion, the positive emotions about a place play an important role in pro-environmental behavior (Ramkissoon et al., 2013). This finding is consistent with the existing literature, a sense of awe may generate awesome, fantastic and unique experiences, and impact pro-environmental behavior (Zelenski & Desrochers, 2021; Zhao et al., 2018). In addition, awe as a basic emotion may moderate the effects of other positive experiences (Li et al., 2019). As an interviewee stated, "*when I saw Danxia Mountain for the first time, I felt that I saw what the textbook describes to see. It verified what the Danxia landform looks like. When I came into Danxia Mountain, I sincerely felt admiration and joy, and hoped to do more for her*" (Li, volunteer, male).

Theoretical implications

First, the findings expand the research on the intrinsic antecedents of volunteers' pro-environmental behavior. Prior research offers valuable insights on intrinsic antecedents of pro-environmental behavior, like place identification and attachment (Atsız et al., 2022; Ramkissoon et al., 2018; Ramkissoon et al., 2012) on resident, employee, and tourist pro-environmental behavior (Udall et al., 2021). This research focused on the effects of volunteering meaningfulness and developed the research on intrinsic antecedents of pro-environmental behavior (Albrecht et al., 2022; Steg et al., 2014). Previous research focuses on outcomes of meaningfulness in the work context (Allan et al., 2019), and this research extends the effects of meaningfulness in protected areas and enriches the research on professional motives to volunteer (Olsen et al., 2018). As for volunteers, compared to extrinsic stimuli, intrinsic psychological motivation is critical in facilitating pro-environmental behavior. Meaningfulness representing psychological satisfaction is a robust intrinsic motivator because

human beings strive to find meaningfulness in life (Aguinis & Glavas, 2019; Im & Chung, 2018). Pro-environmental behavior is not a "have-to" task, but "want-to" task (Junot et al., 2017). This research emphasizes the effects of meaningfulness and expands the antecedents of volunteering pro-environmental behavior in protected areas.

Second, the research explored different effects of emotions regarding organizations and work on pro-environmental behavior and enriched cognitive appraisal theory. Cognitive appraisal theory suggests that cognition affects behavior through emotion (Ng et al., 2019). However, most studies focus on emotions regarding the organization or work separately. This research analyzed of the effects dual emotions, namely pride and environmental passion. Perceived meaningfulness affected pro-environmental behavior through environmental passion, and this responds to the call for integrating cognition and emotion as driving factors of pro-environmental behavior (Daryanto & Song, 2021). In addition, this research enriches cognitive appraisal theory of emotions research by examining the dual mediating role of pride and environmental passion. Previous studies focus on the effect of general emotions. Actually, the emotions that foster individual pro-environmental behavior are specific and complex (Lange & Dewitte, 2020). This investigation applied the two different emotions of pride towards the volunteers' group and environmental passion towards volunteering work. The study indicated that environmental passion has a more significant effect than pride between meaningfulness and pro-environmental behavior. Therefore, the findings develop the research on the emotional drivers of pro-environmental behavior (Lu et al., 2021), and this study bridges the environmental cognition and behavior gap (Farjam, Nikolaychuk, & Bravo, 2019).

Third, this research examined the moderating effects of emotions about a place and shed light on the boundary condition effects of pride and environmental passion on pro-environmental behavior. Although it is proposed that emotions affecting pro-environmental behavior are complex (Lu et al., 2021; Zelenski & Desrochers, 2021), existing research has a focus on emotions at organizations or work separately, and little attention is given to the emotions related to a place or test the interactive effects of different emotions. Compared to employees in organizations or workplaces, volunteer pro-environmental behavior is on a larger scale than an organization, and it is closely related to the place. In addition to pride and environmental passion, awe of the place is a broader and transcendent emotion. The findings were that awe of a place is the psychological basis of individual daily life (Lopes, Lima, & Silva, 2020). The moderating effects of awe were explored. Therefore, this research investigated the awe of the place as an emotional boundary condition of pride and environmental passion, and provides evidence of distinct impacts of different emotions on pro-

environmental behavior. By examining the moderating effects of awe, this research emphasizes the impacts of emotions connected with a place, and brings a new perspective to better understanding individual pro-environmental behavior.

Practical implications

First, volunteer organizations should pay attention to enriching the meaningfulness of volunteering pro-environmental work. Volunteering meaningfulness in terms of value orientation, where volunteers feel they make an impact on protected areas and social norms strengthens commitment and loyalty to this work. In addition, meaningfulness is conducive to strengthening the intrinsic drivers of pro-environmental behavior. Therefore, it is possible for protected area administration departments to promote pro-environmental behavior by highlighting volunteering meaningfulness. Protected area administration departments should enhance the positive meanings of volunteering work, make volunteering meaningful through tasks, and build relationships between volunteers and places.

Second, it is important to enhance and maintain the emotions of volunteers. The management of volunteers must promote volunteer cohesion and strengthen identification and respect with their voluntary groups. Greater passion for volunteering environmental work must be encouraged through job design and meaning expression to stimulate intrinsic pro-environmental behavior. The gap between environmental cognition and behavior must be bridged.

Third, awe of the place needs to be fostered. Awe for natural or cultural wonders should be aroused more comprehensively through experiences of natural environments and science popularization. In addition, the interaction activities between volunteers and places should be increased.

Limitations and future research needs

First, this research had a cross-sectional research design. The survey was completed in the summer vacation time when voluntary science popularization activities are organized. Therefore, there are limitations in explaining the causal relationship between volunteering meaningfulness, pride, environmental passion, and pro-environmental behavior. Future research should conduct a longitudinal study on Danxia Mountain science popularization volunteers to further explain the causal relationships among variables. Second, this research focuses on the impact of meaningfulness, pride and environmental passion on pro-environmental behavior experienced by science popularization volunteers in World Heritage

sites and geoparks based on the cognitive appraisal theory of emotions. Future research should explore the impact of other factors on pro-environmental behavior, such as self-efficacy, psychological capital and place attachment. Combined with different theoretical perspectives, this research explored impacting emotional mechanisms of environment and individuals affecting pro-environmental behavior. Third, with a single data source, self-reporting meaningfulness, pride and passion may be influenced by self-deception and social desirability bias. The questionnaires were randomly distributed and completed anonymously to reduce social desirability bias. In the process of data analysis, Cronbach's α and CFA were applied to test the reliability and validity of key concepts. In addition, the common method basis was within the acceptable range through a CFA test and AVEs. It is better for future research to obtain data from different sources and develop a multi-stage research design to reduce common method bias.

Conclusion

This research explored the effect of meaningfulness on volunteer pro-environmental behavior, investigated the complex emotions of how meaningfulness transforms into pro-environmental behavior based on the cognitive appraisal theory of emotions, and the results enrich pro-environmental behavior research. Awe of the place was introduced into the theoretical model as a moderator, and expanded individual emotions for the volunteering organization to the place. It is concluded that meaningfulness is a critical intrinsic motivator of volunteers' pro-environmental behavior, and it facilitates pro-environmental behavior through pride and environmental passion to volunteering organizations and work. On the larger scale, volunteers' awe of the place strengthens the effects of pride and environmental passion on pro-environmental behavior. This study contributes to pro-environmental behavior research by investigating how volunteering meaningfulness could impact on pro-environmental behavior though complex emotional mechanisms. It will be interesting and important that future researches explore complex emotional mechanisms of individual behaviors.

Reference

Adams, I., Hurst, K., & Sintov, N. D. (2020). Experienced guilt, but not pride, mediates the effect of feedback on pro-environmental behavior. *Journal of Environmental Psychology, 71*, 101476. doi: https://doi.org/10.1016/j.jenvp.2020.101476

Afsar, B., Badir, Y., & Kiani, U. S. (2016). Linking spiritual leadership and employee pro-environmental behavior: The influence of workplace spirituality, intrinsic motivation, and environmental passion. *Journal of Environmental Psychology, 45*, 79-88. doi:

https://doi.org/10.1016/j.jenvp.2015.11.011

Aguinis, H., & Glavas, A. (2019). On Corporate Social Responsibility, Sensemaking, and the Search for Meaningfulness Through Work. *Journal of Management, 45*(3), 1057-1086. doi: 10.1177/0149206317691575

Albrecht, S. L., Bocks, A., Dalton, J., Lorigan, A., & Smith, A. (2022). Pro-Environmental Employee Engagement: The Influence of Pro-Environmental Organizational, Job and Personal Resources. *Sustainability, 14*(1), 43

Alfes, K., Antunes, B., & Shantz, A. D. (2017). The management of volunteers – what can human resources do? A review and research agenda. *The International Journal of Human Resource Management, 28*(1), 62-97. doi: 10.1080/09585192.2016.1242508

Allan, B. A., Batz-Barbarich, C., Sterling, H. M., & Tay, L. (2019). Outcomes of Meaningful Work: A Meta-Analysis. *Journal of Management Studies, 56*(3), 500-528. doi: https://doi.org/10.1111/joms.12406

Anderson, C. L., Monroy, M., & Keltner, D. (2018). Awe in nature heals: Evidence from military veterans, at-risk youth, and college students. *Emotion, 18*(8), 1195-1202. doi: 10.1037/emo0000442

Atsız, O., Ramkissoon, H., & Öğretmenoğlu, M. (2022). Yoga travellers' experiences in guided tours: a multiple case study approach. *Current Issues in Tourism*, 1-7. doi: 10.1080/13683500.2022.2032616

Bailey, C., Yeoman, R., Madden, A., Thompson, M., & Kerridge, G. (2018). A Review of the Empirical Literature on Meaningful Work: Progress and Research Agenda. *Human Resource Development Review, 18*(1), 83-113. doi: 10.1177/1534484318804653

Barrick, M. R., Mount, M. K., & Li, N. (2013). The Theory of Purposeful Work Behavior: The Role of Personality, Higher-Order Goals, and Job Characteristics. *Academy of Management Review, 38*(1), 132-153. doi: 10.5465/amr.2010.0479

Bissing-Olson, M. J., Fielding, K. S., & Iyer, A. (2016). Experiences of pride, not guilt, predict pro-environmental behavior when pro-environmental descriptive norms are more positive. *Journal of Environmental Psychology, 45*, 145-153. doi: https://doi.org/10.1016/j.jenvp.2016.01.001

Bonner, E. T., & Friedman, H. L. (2011). A conceptual clarification of the experience of awe: An interpretative phenomenological analysis. *The Humanistic Psychologist, 39*(3), 222–235

Cheema, S., Afsar, B., & Javed, F. (2020). Employees' corporate social responsibility perceptions and organizational citizenship behaviors for the environment: The mediating roles of organizational identification and environmental orientation fit. *Corporate Social Responsibility and Environmental Management, 27*(1), 9-21. doi: https://doi.org/10.1002/csr.1769

Choi, J. N., Sung, S. Y., Lee, K., & Cho, D.-S. (2011). Balancing cognition and emotion: Innovation implementation as a function of cognitive appraisal and emotional reactions toward innovation. *Journal of Organizational Behavior, 32*(1), 107-124. doi: https://doi.org/10.1002/job.684

Coghlan, A., Buckley, R., & Weaver, D. (2012). A framework for analysing awe in tourism experiences. *Annals of Tourism Research, 39*(3), 1710-1714. doi: 10.1016/j.annals.2012.03.007

Daryanto, A., & Song, Z. (2021). A meta-analysis of the relationship between place attachment and pro-environmental behaviour. *Journal of Business Research, 123*, 208-219. doi: https://doi.org/10.1016/j.jbusres.2020.09.045

Davis, J. L., Le, B., & Coy, A. E. (2011). Building a model of commitment to the natural environment to predict ecological behavior and willingness to sacrifice. *Journal of Environmental Psychology, 31*(3), 257-265. doi: https://doi.org/10.1016/j.jenvp.2011.01.004

De Roeck K, F. O. (2018). Corporate social responsibility and ethical leadership: Investigating their interactive effect on employees' socially responsible behaviors. *Journal of Business Ethics, 151*(4), 923-939.

DiEnno, C. M., & Thompson, J. L. (2013). For the love of the land: How emotions motivate volunteerism in ecological restoration. *Emotion, Space and Society, 6*, 63-72. doi: https://doi.org/10.1016/j.emospa.2012.02.002

Esfandiar, K., Pearce, J., Dowling, R., & Goh, E. (2022). Pro-environmental behaviours in protected areas: A systematic literature review and future research directions. *Tourism Management Perspectives, 41*, 100943. doi: https://doi.org/10.1016/j.tmp.2022.100943

Farjam, M., Nikolaychuk, O., & Bravo, G. (2019). Experimental evidence of an environmental attitude-behavior gap in high-cost situations. *Ecological Economics, 166*, 106434. doi: https://doi.org/10.1016/j.ecolecon.2019.106434

Frieder, R., Wang, G., & Oh, I.-S. (2017). Linking Job-Relevant Personality Traits, Transformational Leadership, and Job Performance via Perceived Meaningfulness at Work: A Moderated Mediation Model. *Journal of Applied Psychology, 103*. doi: 10.1037/apl0000274

Gu, D., Jiang, J., Zhang, Y., Sun, Y., Jiang, W., & Du, X. (2020). Concern for the future and saving the earth: When does ecological resource scarcity promote pro-environmental behavior? *Journal of Environmental Psychology, 72*, 101501. doi: https://doi.org/10.1016/j.jenvp.2020.101501

Han, Sung, M., & Suh, B. (2021). Linking meaningfulness to work outcomes through job characteristics and work engagement. *Human Resource Development International, 24*(1), 3-22. doi: 10.1080/13678868.2020.1744999

Hartmann, P., Eisend, M., Apaolaza, V., & D'Souza, C. (2017). Warm glow vs. altruistic values: How important is intrinsic emotional reward in proenvironmental behavior? *Journal of Environmental Psychology, 52*, 43-55. doi: https://doi.org/10.1016/j.jenvp.2017.05.006

Hu, J., & Hirsh, J. (2017). The Benefits of Meaningful Work: A Meta-Analysis. *Academy of Management Proceedings, 2017*(1), 13866. doi: 10.5465/AMBPP.2017.13866abstract

Im, S., & Chung, Y. W. (2018). Employee Volunteering Meaningfulness and Organizational Citizenship Behavior: Exploring the Effects of Organizational Support, Pride, and Trust. *Sustainability, 10*(12), 4835

Jans, L. (2021). Changing environmental behaviour from the bottom up: The formation of pro-environmental social identities. *Journal of Environmental Psychology, 73*, 101531. doi: https://doi.org/10.1016/j.jenvp.2020.101531

Junot, A., Paquet, Y., & Martin-Krumm, C. (2017). Passion for outdoor activities and environmental behaviors: A look at emotions related to passionate activities. *JOURNAL OF ENVIRONMENTAL PSYCHOLOGY, 53*, 177-184. doi:

10.1016/j.jenvp.2017.07.011
Kahn, W. (1990). Psychological Conditions of Personal Engagement and Disengagement at Work. *Academy of Management Journal, 33*, 692-724. doi: 10.5465/256287
Keltner, D., & Haidt, J. (2003). Approaching awe, a moral, spiritual, and aesthetic emotion. *Cognition and Emotion, 17*(2), 297-314. doi: 10.1080/02699930302297
Kubiak, E. (2020). Increasing perceived work meaningfulness by implementing psychological need-satisfying performance management practices. *Human Resource Management Review*, 100792. doi: https://doi.org/10.1016/j.hrmr.2020.100792
Lange, F., & Dewitte, S. (2020). Positive affect and pro-environmental behavior: A preregistered experiment. *Journal of Economic Psychology, 80*, 102291. doi: https://doi.org/10.1016/j.joep.2020.102291
Lange, F., & Dewitte, S. (2022). The Work for Environmental Protection Task: A consequential web-based procedure for studying pro-environmental behavior. *Behavior Research Methods, 54*(1), 133-145. doi: 10.3758/s13428-021-01617-2
Li, Li, A., Sun, Y., Li, H. e., Liu, L., Zhan, Y., . . . Zhong, Y. (2019). The Effect of Preceding Self-Control on Prosocial Behaviors: The Moderating Role of Awe. *Frontiers in Psychology, 10*. doi: 10.3389/fpsyg.2019.00682
Li, J.-J., Dou, K., Wang, Y.-J., & Nie, Y.-G. (2019). Why Awe Promotes Prosocial Behaviors? The Mediating Effects of Future Time Perspective and Self-Transcendence Meaning of Life. *Frontiers in Psychology, 10*. doi: 10.3389/fpsyg.2019.01140
Lin, W., Koopmann, J., & Wang, M. (2020). How Does Workplace Helping Behavior Step Up or Slack Off? Integrating Enrichment-Based and Depletion-Based Perspectives. *Journal of Management, 46*(3), 385-413. doi: 10.1177/0149206318795275
Liu, T., Geng, L., Ye, L., & Zhou, K. (2019). "Mother Nature" enhances connectedness to nature and pro-environmental behavior. *Journal of Environmental Psychology, 61*, 37-45. doi: https://doi.org/10.1016/j.jenvp.2018.12.003
Lopes, S., Lima, M., & Silva, K. (2020). Nature can get it out of your mind: The rumination reducing effects of contact with nature and the mediating role of awe and mood. *Journal of Environmental Psychology, 71*, 101489. doi: https://doi.org/10.1016/j.jenvp.2020.101489
Loureiro, S. M. C., Guerreiro, J., & Han, H. (2022). Past, present, and future of pro-environmental behavior in tourism and hospitality: a text-mining approach. *Journal of Sustainable Tourism, 30*(1), 258-278. doi: 10.1080/09669582.2021.1875477
Lu, H., Zhang, W., Diao, B., Liu, Y., Chen, H., Long, R., & Cai, S. (2021). The progress and trend of pro-environmental behavior research: a bibliometrics-based visualization analysis. *Current Psychology*. doi: 10.1007/s12144-021-01809-1
Luu, T. T. (2020). Reducing food waste behavior among hospitality employees through communication: dual mediation paths. *International Journal of Contemporary Hospitality Management, 32*(5), 1881-1904. doi: 10.1108/IJCHM-09-2019-0779
Martin, L., White, M. P., Hunt, A., Richardson, M., Pahl, S., & Burt, J. (2020). Nature contact, nature connectedness and associations with health, wellbeing and pro-environmental behaviours. *Journal of Environmental Psychology, 68*, 101389. doi: https://doi.org/10.1016/j.jenvp.2020.101389
Masson, T., & Otto, S. (2021). Explaining the difference between the predictive power of value

orientations and self-determined motivation for proenvironmental behavior. *Journal of Environmental Psychology, 73*, 101555. doi: https://doi.org/10.1016/j.jenvp.2021.101555

May, D. R., Gilson, R. L., & Harter, L. M. (2004). The psychological conditions of meaningfulness, safety and availability and the engagement of the human spirit at work. *Journal of Occupational and Organizational Psychology, 77*(1), 11-37. doi: https://doi.org/10.1348/096317904322915892

Montani, F., Boudrias, J.-S., & Pigeon, M. (2020). Employee recognition, meaningfulness and behavioural involvement: test of a moderated mediation model. *The International Journal of Human Resource Management, 31*(3), 356-384. doi: 10.1080/09585192.2017.1288153

Moors, A., Ellsworth, P. C., Scherer, K. R., & Frijda, N. H. (2013). Appraisal Theories of Emotion: State of the Art and Future Development. *Emotion Review, 5*(2), 119-124. doi: 10.1177/1754073912468165

Murnieks, C. Y., Mosakowski, E., & Cardon, M. S. (2012). Pathways of Passion: Identity Centrality, Passion, and Behavior Among Entrepreneurs. *Journal of Management, 40*(6), 1583-1606. doi: 10.1177/0149206311433855

Ng, T. W. H., Yam, K. C., & Aguinis, H. (2019). Employee perceptions of corporate social responsibility: Effects on pride, embeddedness, and turnover. *Personnel Psychology, 72*(1), 107-137. doi: https://doi.org/10.1111/peps.12294

Olsen, L. M., Vogt, C., & Andereck, K. (2018). Sustaining the common good: tourism professional motives to volunteer for the tourism industry. *Tourism Recreation Research, 43*(1), 68-81. doi: 10.1080/02508281.2017.1371474

Peng, J., Chen, X., Zou, Y., & Nie, Q. (2021). Environmentally specific transformational leadership and team pro-environmental behaviors: The roles of pro-environmental goal clarity, pro-environmental harmonious passion, and power distance. *Human Relations, 74*(11), 1864-1888. doi: 10.1177/0018726720942306

Perlin, J. D., & Li, L. (2020). Why Does Awe Have Prosocial Effects? New Perspectives on Awe and the Small Self. *Perspectives on Psychological Science, 15*(2), 291-308. doi: 10.1177/1745691619886006

Piff, P. K., Dietze, P., Feinberg, M., Stancato, D. M., & Keltner, D. (2015). Awe, the small self, and prosocial behavior. *Journal of Personality and Social Psychology, 108*(6), 883–899

Ramkissoon, H., Graham Smith, L. D., & Weiler, B. (2013). Testing the dimensionality of place attachment and its relationships with place satisfaction and pro-environmental behaviours: A structural equation modelling approach. *Tourism Management, 36*, 552-566. doi: https://doi.org/10.1016/j.tourman.2012.09.003

Ramkissoon, H., Mavondo, F., & Uysal, M. (2018). Social involvement and park citizenship as moderators for quality-of-life in a national park. *Journal of Sustainable Tourism, 26*(3), 341-361. doi: 10.1080/09669582.2017.1354866

Ramkissoon, H., Weiler, B., & Smith, L. D. G. (2012). Place attachment and pro-environmental behaviour in national parks: the development of a conceptual framework. *Journal of Sustainable Tourism, 20*(2), 257-276. doi: 10.1080/09669582.2011.602194

Robertson, J. L., & Barling, J. (2013). Greening organizations through leaders' influence on employees' pro-environmental behaviors. *Journal of Organizational Behavior, 34*(2),

176-194. doi: https://doi.org/10.1002/job.1820

Scharrer, L., Rupieper, Y., Stadtler, M., & Bromme, R. (2017). When science becomes too easy: Science popularization inclines laypeople to underrate their dependence on experts. *Public Understanding of Science, 26*(8), 1003-1018. doi: 10.1177/0963662516680311

Schutte, N. S., Searle, T., Meade, S., & Dark, N. A. (2012). The effect of meaningfulness and integrative processing in expressive writing on positive and negative affect and life satisfaction. *Cognition and Emotion, 26*(1), 144-152. doi: 10.1080/02699931.2011.562881

Shen, J., & Benson, J. (2016). When CSR Is a Social Norm:How Socially Responsible Human Resource Management Affects Employee Work Behavior. *Journal of Management, 42*(6), 1723-1746. doi: 10.1177/0149206314522300

Shiota, M. N., Keltner, D., & Mossman, A. (2007). The nature of awe: Elicitors, appraisals, and effects on self-concept. *Cognition and Emotion, 21*(5), 944-963. doi: 10.1080/02699930600923668

Shipley, N. J., & van Riper, C. J. (2022a). Pride and guilt predict pro-environmental behavior: A meta-analysis of correlational and experimental evidence. *Journal of Environmental Psychology, 79*, 101753. doi: https://doi.org/10.1016/j.jenvp.2021.101753

Shipley, N. J., & Van Riper, C. J. (2022b). Pride and guilt predict pro-environmental behavior: A meta-analysis of correlational and experimental evidence. *Journal of Environmental Psychology, 79*. doi: 10.1016/j.jenvp.2021.101753

Steg, L., Bolderdijk, J. W., Keizer, K., & Perlaviciute, G. (2014). An Integrated Framework for Encouraging Pro-environmental Behaviour: The role of values, situational factors and goals. *Journal of Environmental Psychology, 38*, 104-115. doi: https://doi.org/10.1016/j.jenvp.2014.01.002

Steger, M. F., Dik, B. J., & Duffy, R. D. (2012). Measuring Meaningful Work:The Work and Meaning Inventory (WAMI). *Journal of Career Assessment, 20*(3), 322-337. doi: 10.1177/1069072711436160

Stellar, J. E., Gordon, A. M., Piff, P. K., Cordaro, D., Anderson, C. L., Bai, Y., . . . Keltner, D. (2017). Self-Transcendent Emotions and Their Social Functions: Compassion, Gratitude, and Awe Bind Us to Others Through Prosociality. *Emotion Review, 9*(3), 200-207. doi: 10.1177/1754073916684557

Supanti, D., & Butcher, K. (2019). Is corporate social responsibility (CSR) participation the pathway to foster meaningful work and helping behavior for millennials? *International Journal of Hospitality Management, 77*, 8-18. doi: https://doi.org/10.1016/j.ijhm.2018.06.001

Tims, M., Derks, D., & Bakker, A. B. (2016). Job crafting and its relationships with person–job fit and meaningfulness: A three-wave study. *Journal of Vocational Behavior, 92*, 44-53. doi: https://doi.org/10.1016/j.jvb.2015.11.007

Udall, A. M., de Groot, J. I. M., De Jong, S. B., & Shankar, A. (2021). How I See Me—A Meta-Analysis Investigating the Association Between Identities and Pro-environmental Behaviour. *Frontiers in Psychology, 12*. doi: 10.3389/fpsyg.2021.582421

Wang, L., Zhang, G., Shi, P., Lu, X., & Song, F. (2019). Influence of Awe on Green Consumption: The Mediating Effect of Psychological Ownership. *Frontiers in Psychology, 10*, 02484. doi: 10.3389/fpsyg.2019.02484

Whitmarsh, L., & O'Neill, S. (2010). Green identity, green living? The role of pro-environmental self-identity in determining consistency across diverse pro-environmental behaviours. *Journal of Environmental Psychology, 30*(3), 305-314. doi: https://doi.org/10.1016/j.jenvp.2010.01.003

Xu, Z., Yang, G., Wang, L., Guo, L., & Shi, Z. (2022). How does destination psychological ownership affect tourists' pro-environmental behaviors? A moderated mediation analysis

Journal of Sustainable Tourism, 1-19. doi: 10.1080/09669582.2022.2049282

Yang, Y., Hu, J., Jing, F., & Nguyen, B. (2018). From Awe to Ecological Behavior: The Mediating Role of Connectedness to Nature. *Sustainability, 10*(7), 2477

Yusliza, M. Y., Amirudin, A., Rahadi, R. A., Nik Sarah Athirah, N. A., Ramayah, T., Muhammad, Z., . . . Mokhlis, S. (2020). An Investigation of Pro-Environmental Behaviour and Sustainable Development in Malaysia. *Sustainability, 12*(17), 7083

Zelenski, J. M., & Desrochers, J. E. (2021). Can positive and self-transcendent emotions promote pro-environmental behavior? *Current opinion in psychology, 42*, 31-35. doi: 10.1016/j.copsyc.2021.02.009

Zhao, H., Zhang, H., Xu, Y., Lu, J., & He, W. (2018). Relation Between Awe and Environmentalism: The Role of Social Dominance Orientation. *Frontiers in psychology, 9*, 2367. doi: 10.3389/fpsyg.2018.02367