Effective Pro-environmental Communication: Message Framing and Context

Congruency Effect

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Abstract

This research investigates the effectiveness of two types of message framing in pro-environmental communication: prescriptive versus proscriptive appeals in daily and tourism contexts. Two experimental studies were conducted. Study 1a focused on natural park and street park scenarios, while Study 1b examined hotel and office scenarios. Study 2 replicated Study 1 and further explored the mediating role of anticipated pride and guilt. The results indicate that in tourism contexts, prescriptive-framed appeals are more effective than proscriptive-framed appeals, whereas in daily contexts, proscriptive-framed appeals are more effective. Furthermore, the message framing-context congruency effect is mediated by the anticipated pride and guilt. These findings fill a literature gap by revealing the interaction between message framing and context in pro-environmental communication, providing insights for managers to customize appeals, using prescriptive-framed messages in tourism contexts and proscriptive-framed messages in daily contexts, while leveraging anticipated pride and guilt to motivate eco-friendly actions.

Keywords: pro-environmental behavior, message framing, prescriptive appeal, proscriptive appeal, anticipated emotion
1. Introduction

The tourism and hospitality industries face significant challenges in minimizing their environmental impact (Wu, Font, & Liu, 2020; Yang et al., 2023). Understanding pro-environmental behavior through research is crucial for promoting sustainable development within these industries (Ballantyne & Packer, 2011; L. Wang & Lyu, 2019). Companies are actively seeking effective interventions to encourage tourists to adopt sustainable practices (Vlek & Steg, 2007; Xu et al., 2020). They often use pro-environmental appeals in their communication messages (León & Araña, 2020), framed in different ways to persuade their customers to act in a pro-environmental way (Tversky & Kahneman, 1981). However, the current theoretical frameworks are insufficient in explaining individuals' pro-environmental behaviors across different contexts, creating a knowledge gap that hampers the development of effective interventions. Research suggests that appeals proven effective in household settings may not have the same impact in the travel and tourism context, possibly due to the hedonic nature of tourism (Dolnicar, Knezevic Cvelbar, & Grün, 2017) or the context-dependent nature of pro-environmental behaviors (Miao & Wei, 2013; Wu, Font, & Liu, 2021).

Two prevalent framing approaches, the prescriptive and proscriptive frames, are often used to promote pro-environmental behaviors (Janoff-Bulman, Sheikh, & Hepp, 2009). The prescriptive frame emphasizes moral conduct by stating what people should do, while the proscriptive frame highlights refraining from harm by specifying what people should not do (Janoff-Bulman, Sheikh, & Hepp, 2009). The prescriptive frame is associated with the
approach system, aiming to elicit behavioral activation, whereas the prescriptive frame relies on the avoidance system, aiming for behavioral inhibition (Janoff-Bulman & Carnes, 2013). Empirical studies have suggested that individuals are less inclined to engage in pro-environmental practices during travel compared to at home (Dolnicar & Grün, 2009; Holmes, Dodds, & Frochot, 2019; Line, Hanks, & Miao, 2017). This implies that the same framing of a message could elicit different responses depending on the context. Matching messages to the context can be a powerful technique of persuasion (Teeny et al., 2021). However, little is known about how the prescriptive and proscriptive frames can be optimally aligned with the specific contexts of daily life and tourism in promoting pro-environmental behaviors.

This study aims to explore the effective strategies for promoting pro-environmental behaviors in the distinct settings of daily life and tourism, by delving into the intricate dynamics between the two message frames (prescriptive and proscriptive) and the two contexts. According to the construal level theory (Trope & Liberman, 2010; Trope, Liberman, & Wakslak, 2007), the tourism context is psychologically distant, where individuals tend to prioritize approach-related goals, this is in contrast to the home environment, where individuals are more focused on avoiding negative consequences (X.Liu, Wan, & Yi, 2022). We predict that in the tourism context, individuals are more likely to engage in pro-environmental behavior in response to the prescriptive-framed appeal; while in the daily context, they are more likely to engage in pro-environmental behavior in response to the proscriptive-framed appeal. Moreover, according to the theory of moral disengagement (Bandura et al., 1996), individuals may undergo a heightened sense of adventure along with a diminished sense of responsibility during travel. This shift in mindset during travel could
result in reduced motivation to adopt eco-friendly behaviors (Grazzini et al., 2018). The transition from the familiar home environment to the liberating “holiday mode” can lead individuals to become less receptive to pro-environmental appeals and more inclined to engage in irresponsible behaviors without experiencing guilt (Jørgensen & Reichenberger, 2022). Accordingly, we further predict that the effect of a prescriptive or proscriptive frame on behavior is mediated by the anticipated emotions of pride or guilt. This prediction is also supported by the notion that appeals framed positively or negatively can evoke feelings of pride or guilt (Tversky & Kahneman, 1981), and individuals are inclined to seek feelings of pride while avoiding guilt by regulating their behaviors (Steg & Vlek, 2009). To test the hypotheses, we conducted two major experimental studies. In Study 1a, a national park was set as the stimulus for the tourism context, while a street park was used as the stimulus for the daily context. Study 1b replicates the congruency effect in the office (daily) versus hotel (tourism) setting. Study 2 investigated the mediating role of anticipated pride and guilt.

This research contributes to the literature in several ways. First, our research uncovers the congruency effect between pro-environmental appeals and the contexts of home and away. It extends the prior works on pro-environmental communication, particularly the interaction between message appeals and situational factors (Steg and Vlek, 2009). It empirically verifies that to effectively communicate pro-environmental messages, there is a need for framing the appeal to the unique features of the tourism context. Second, this research deepens our understanding of how message appeal works by uncovering the mediating mechanism of how the two message appeals work through anticipated emotion, i.e. pride or guilt respectively, which then regulate an individual’s behavioral response (Antonetti
& Maklan, 2014; Patrick, Chun, & Macinnis, 2009). Third, the findings provide tourism and hospitality managers with practical implications to align the framing of pro-environmental appeals with the context to develop effective pro-environmental communications.

2. Literature Review and Hypotheses

2.1. Framing of pro-environmental appeal

The framing of appeals encodes persuasive messages either as positive frames, which focus on obtaining positive consequences, or negative frames, which focus on avoiding negative consequences (Levin, Schneider, & Gaeth, 1998). The positive-negative pro-environmental appeal frames are well examined in tourism literature but the findings are mixed. For example, while Blose, Mack, and Pitts (2015) and Grazzini, et al. (2018) found that loss-framed messages are more effective than gain-framed ones, Chi, Denton, and Gursoy (2021) suggested a gain-framed (vs. loss-framed) message combined with objective information resulted in higher intentions of carbon offsetting behaviors. Though it was also argued that gain-framed appeals may create a bigger effect given the hedonic nature of tourism (Kim & Kim, 2014), it is still unclear whether and in what context positive frames or negative frames are more effective.

While prior research has investigated the effectiveness of pro-environmental appeals framed as descriptive versus injunctive (White & Simpson, 2013), prevention-focused versus promotion-focused (Lagomarsino, Lemarié, & Puntiroli, 2020), and loss versus gain (Grazzini, et al., 2018), little is known about the effectiveness of pro-environmental using prescriptive and proscriptive frames (Janoff-Bulman, Sheikh, & Hepp, 2009). The
prescriptive frame represents a norm-supporting persuasion, and the proscriptive frame represents a norm-violating persuasion (Steg et al., 2014). The former is sensitive to positive outcomes, and focuses on what we should do, while the latter is sensitive to negative outcomes, and focuses on what we should not do. Specifically in pro-environmental communications, prescriptive messages are those that tell people what they should do to be environmentally friendly. For example, “Please use reusable bags.” These messages suggest a specific action that people can take to help the environment. On the other hand, proscriptive messages are those that tell people what they should not do. For example, “Do not use single-use plastic bags.” Both prescriptive and proscriptive messages are often used in tourism and everyday situations, but their effectiveness at communicating environmental values and behaviors is not well scrutinized. Our research focuses on comparing the effectiveness of these two types of messages. By doing this, we hope to better understand which types of messages are more effective at promoting pro-environmental behaviors in the two different contexts.

2.2. Context matters

The construal level theory suggests that individuals perceive and mentally represent objects or events differently based on their psychological distance from “the self, here, and now” (Trope & Liberman, 2010). This distance is influenced by four dimensions, i.e., spatial, temporal, social, and probabilistic differences (Trope, Liberman, & Wakslak, 2007). The distinction between daily life and tourism reflects the “self-others” difference, compelling people to seek unique experiences and interact with individuals outside their usual social
circles. Spatially, tourism involves leaving one’s home environment, and despite physically being present at the destination ("here"), tourists perceive it as a place belonging to "others". Temporally, tourism offers experiences that deviate from routine ("now"), such as heritage tourism’s exploration of the “now-then” difference and connection to the past (Scarpi & Raggiotto, 2023). The probabilistic dimension adds an element of uncertainty and novelty in tourism, contributing to the psychological distance as individuals step outside their comfort zones.

The shift from the daily context to a tourism setting can have a significant impact on an individual’s mental processes and behaviors (Miao & Wei, 2013; Qin & Hsu, 2022; Xu et al., 2020). Individuals often experience a mental shift when they go on vacation to “holiday mode” or “vacation mindset”. This shift can be characterized by a feeling of detachment from their everyday lives, a sense of relaxation and adventure, and a reduced sense of responsibility. When tourists enter such a permissive domain without social constraints, they may engage in deviant behavior (Uriely, Ram, & Malach-Pines, 2011). For instance, tourists have a greater intention to misbehave (Wan, Hui, & Qiu, 2021), are more likely to commit acts of vandalism (Bhati & Pearce, 2016), and exhibit negative behavior (Jørgensen & Reichenberger, 2022). According to Jørgensen and Reichenberger (2022), tourism can be seen as a liminal space where moral disengagement can be more readily activated, that is, tourists may feel that they are in a temporary space where normal moral rules do not apply, which makes it easier for them to engage in negative behavior without feeling as guilty as they would in an everyday context.
Previous empirical studies on pro-environmental behavior consistently show that individuals are less likely to engage in pro-environmental practices when they are traveling compared to when they are at home (Dolnicar & Grün, 2009; Holmes, Dodds, & Frochot, 2019; Line, Hanks, & Miao, 2017), highlighting a spillover failure from home to tourism. This can be explained by the “vacation mindset” or the hedonistic nature of tourism (Grazzini et al., 2018). Moreover, there is also an intention-behavior gap, where people’s pro-environmental intentions elicited by the tourism environment fail to translate into actual behavior after travel (Ballantyne & Packer, 2011; Juvan & Dolnicar, 2014), highlighting a spillover failure from tourism to home. The aforementioned difficulties in behavioral transformation are relevant to contextual change and therefore can be better understood by considering the context-specific nature of pro-environmental intentions and subsequent behaviors (Wu, Font, & Liu, 2021).

2.3. Context and pro-environmental appeal

The effectiveness of pro-environmental appeals in triggering pro-environmental behaviors hinges on the context, in which actions are made (Dolnicar, Knezevic Cvelbar, & Grün, 2017). Dolnicar, Knezevic Cvelbar, and Grün (2017) concluded from their field experiment at a four-star hotel that interventions proven to be effective in the home context may not work in the tourism context. While various moderators, e.g., construal level (White, Macdonnell, & Dahl, 2011), egoistic values (Lagomarsino, Lemarié, & Puntiroli, 2020), and social group (Cvelbar, Grün, & Dolnicar, 2017; Gössling, Araña, & Aguiar-Quintana, 2019)
have been examined in the studies of message framing on pro-environmental behavior, the moderating role of context is largely overlooked.

According to the construal level theory, the greater the psychological distance, the higher the level of construal (Trope, Liberman, & Wakslak, 2007). Individuals tend to adopt a more abstract and general way of thinking about distant events or objects, whereas they tend to focus on concrete and specific details when dealing with proximal events or objects. Several studies have demonstrated people perceived themselves to be more positive and focused on the positive side in the distant future but paid more attention to the negative aspects in the near future (X.Liu, Wan, & Yi, 2022). When a decision is imminent, consumers respond more favorably to a prevention-framed message, while for distant decisions, they favor a promotion-focused message (Mogilner, Aaker, & Pennington, 2008). While such findings were based on the temporal dimension, we argue this effect may happen across other dimensions of psychological distance.

The tourism context is characterized by psychological distance from the home environment, which influences how individuals adopt the level of construal in their cognitive processes. In comparison to the daily life setting, the psychological distance is much greater in the travel setting. Specifically, during travel, individuals tend to operate at a higher level of construal, prioritizing abstract and general concepts over specific details, especially in certain tourism destinations that are psychologically more distant (Scarpi & Raggiotto, 2023). Conversely, in their daily lives, individuals tend to employ a lower level of construal, which prompts a focus on concrete and specific details. There is a match between a high construal
level and a promotion-focused message while a congruity between a low construal level and a prevention-focused message (Lee & Aaker, 2004). Prescriptive and proscriptive appeals represent promotion orientation and prevention orientation (Janoff-Bulman, Sheikh, & Hepp, 2009). A match between an individual’s construal level and the message appeal type will increase the effectiveness of the message (Frías-Jamilena, Fernández-Ruano, & Polo-Peña, 2022; S. Wang & Lehto, 2020). Therefore, it is predicted that the match between the context and pro-environmental appeal would enhance the persuasion effect, that is, in the distal tourism context, the prescriptive appeal will be more effective, whereas, for proximal daily context, the proscriptive appeal will be more effective. Accordingly, we develop the following hypotheses:

**Hypothesis 1a:** In the tourism context, prescriptive-framed appeal is more effective than proscriptive-framed appeal.

**Hypothesis 1b:** In the daily context, proscriptive-framed appeal is more effective than prescriptive-framed appeal.

2.4. The mediating role of anticipated pride/guilt

Anticipated pride and guilt are self-conscious emotions that drive the self-regulation process (Antonetti & Maklan, 2014). Pride is a self-enhancing positive emotion that influences ethical judgment and decision (Patrick, Chun, & Macinnis, 2009), while guilt is a negative emotion that drives self-regulation and ethical behavior (Mishra & Mishra, 2011).
People tend to approach the feeling of pride and try to avoid feeling guilt by regulating their behaviors.

Pro-environmental appeals framed as positive or negative can elicit certain psychological evaluation processes (Tversky & Kahneman, 1981). The experiences of anticipated pride and guilt based on people’s assessment of their moral standards arise from the evaluation of future behaviors (Shipley & van Riper, 2022) and both increased anticipated pride and guilt lead to pro-environmental behavior. Anticipated pride appears in the pursuit of valued goals or behaviors that conform to their moral standards (Williams & DeSteno, 2008) while anticipated guilt arises following a prediction of negative consequences “if not helping” (Mohr, Lichtenstein, & Janiszewski, 2012). When people see a pro-environmental appeal framed as “what we should do”, they experience an orientation toward the achievement of that positive goal (anticipated pride), whereas when people see a pro-environmental appeal framed as “what we should not do”, they will try to avoid these negative outcomes (anticipated guilt).

Tourism and daily contexts direct people to distinct moral emotions. As mentioned earlier, people tend to adopt a higher level of construal in the tourism context compared to the daily environment and this discrepancy in construal level activates different regulatory focus (Lee & Aaker, 2004; Trope, Liberman, & Wakslak, 2007; White, Macdonnell, & Dahl, 2011). According to Higgins (2002), regulatory focus comprises two motivational systems that guide self-regulation: the promotion system, which adopts an approach-oriented method to achieve goals and the prevention system, which uses avoidance strategies to prevent losses.
Additionally, the adoption of approach or avoidance strategies also renders positive or negative-valence emotional outcomes more accessible to individuals (Higgins, 2002). Specifically, people in a higher construal-level environment tend to activate the promotion system, prioritizing achievement outcomes and responding more positively to positive feelings. On the other hand, people in a lower construal-level environment are likely to adopt a prevention mindset, emphasizing avoidance goals and reacting more favorably to negative feelings (Cai & Leung, 2020). Anticipated pride is a positive emotion, and anticipated guilt is a negative emotion (Shipley & van Riper, 2022). Thus, the tourism context will elicit more reaction to anticipated pride, whereas the daily context will enhance the individual’s response to anticipated guilt. Taken as a whole, we hypothesized that anticipated emotion mediates the appeal-context congruency effect on individual response:

**Hypothesis 2a:** The effect of prescriptive-framed pro-environmental appeal in the tourism context is mediated through anticipated pride, such that prescriptive-framed pro-environmental appeal increases anticipated pride in tourism settings, which prompts pro-environmental behavior.

**Hypothesis 2b:** The effect of proscriptive-framed pro-environmental appeal in the daily context is mediated through anticipated guilt, such that proscriptive-framed pro-environmental appeal increases anticipated guilt in daily settings, which prompts pro-environmental behavior.

[Figure 1.]
3. Methodology

Two pilot studies and three main studies were carried out to verify the proposed hypotheses. In the pilot studies, the effectiveness of experimental stimuli was examined for the success of manipulation. Study 1a investigated the congruency effect between pro-environmental appeals (prescriptive-framed vs. proscriptive-framed) and context (tourism vs. daily) on participants’ responses (H1). A national park was set as the tourism context while a street park was used as the stimulus for the daily context. Study 1b enhanced the validity and robustness of the findings drawn from Study 1a and extended the applicable scenario by replicating the congruency effect in the office (daily) versus hotel (tourism) setting. Water conservation behavior was used as the proxy for pro-environmental behavior, which was highly specific to the context. Study 2 investigated the mediating role of anticipated pride and guilt (H2) in the effect of pro-environmental appeal and context on participants’ responses. All data were collected from May 2022 to October 2022. The overview of the studies is presented in Table 1 and the profiles of the participants are shown in Table 2.

4. Pilot Studies

4.1. Pilot Study A: Context (daily vs. tourism)

Pilot study A includes two pretests to ensure the validity of context manipulation. One pretest validates the difference between daily and tourism contexts in a national park versus a
street park setting while the other validates in a hotel versus an office setting. Pictures of a national park and a street park were used as the tourism context and daily context manipulation respectively. A picture of a hotel was used as the tourism context while a picture of an office was used to represent the daily context (see Appendix A for pictures).

All stimuli’ names and locations were not mentioned to control for the differences in familiarity. Participants were first assigned to either a tourism context or a daily context and then responded to questions measuring perceived psychological distance, e.g., “How far is the current environment from your usual place of residence?” or “How likely are you to be in the current environment compared to your usual place of residence?” (1 = very similar, 7 = very different). Both of the items were adopted from Zhang and Wang (2009).

For the park setting pretest, 120 participants (40.8% male; $M_{\text{age}} = 28.16$ years) were recruited from Credamo, a leading online survey platform in China, to complete the task. All participants were Chinese. Results of an independent sample t-test showed that the national park picture was perceived to show higher natural environmental differences ($M_{\text{national park}} = 5.53$) than in the daily context ($M_{\text{street park}} = 3.83$, $t(118) = 14.956$, $p < .001$). For the hotel/office setting pretest, 56 participants were recruited from Credamo (46.4% male; $M_{\text{age}} = 28.4$ years). Results also confirmed the successful manipulation of context, as the hotel ($M_{\text{hotel}} = 4.79$) was perceived to be more psychologically distant than the office ($M_{\text{office}} = 6.00$, $t(54) = -4.028$, $p < .001$).

Results of Pilot Study A showed the manipulations of context stimuli were appropriate and thus could be applied in subsequent studies.
4.2. Pilot Study B: Pro-environmental Appeal (prescriptive vs. proscriptive)

Pilot study B also consists of two groups of experiment stimuli to ensure the validity of pro-environmental appeal frames. The stimuli were developed using Photoshop. The prescriptive appeal used words starting with “Do” while the proscriptive appeal used words starting with “Don’t”. Specifically, in the park setting, the prescriptive appeal was “Please protect the environment” and the proscriptive appeal was “Please don’t damage the environment”. In the hotel/office setting, as we used water conservation behavior as the dependent variable, the prescriptive appeal wrote, “Please save water”, and the proscriptive appeal wrote, “Please don’t waste water” (see Appendix A for pictures). Variations between the two frames were controlled following Levin et al.’s (2002) suggestions that the positive and negative framing should be objectively equivalent and describe the same attribute.

Participants were first randomly presented with either a prescriptive pro-environmental appeal or a proscriptive pro-environmental appeal. After being asked to read the information presented in the picture attentively, participants answered the bipolar 7-point single-item question, “To what extent do you think this message appeal is framed as proscriptive (stressing what we should not do) or prescriptive (stressing what we should do)?” (1 = very prescriptive, 7 = very proscriptive). To exclude influence from other attributes and ensure the effectiveness of framing, we also asked participants about their perceptions of the importance, credibility, and understandability of the message on single-item 7-point questions adapted from Lagomarsino, Lemarié, and Puntiroli et al. (2020) (1 = not at all, 7 = very much).
For appeals in the park setting, 120 participants were recruited from Credamo (40.8% male; \(M_{\text{age}} = 28.16\) years). Results of an independent sample t-test showed that participants can successfully differentiate the two types of appeals (\(M_{\text{prescriptive}} = 1.97, M_{\text{proscriptive}} = 6.43, t(118) = -2.098, p < .001\)). There were no significant differences between the two groups of subjects on the perception of the importance (\(M_{\text{prescriptive}} = 6.05, M_{\text{proscriptive}} = 6.18, t(118) = -.888, p > 0.1\)), credibility (\(M_{\text{prescriptive}} = 6.32, M_{\text{proscriptive}} = 6.43, t(118) = -1.164, p > 0.1\)) and understandability (\(M_{\text{prescriptive}} = 6.48, M_{\text{proscriptive}} = 6.65, t(118) = -1.759, p > 0.1\)) of the appeal. The other pretest conducted in the hotel setting showed consistency. Results of 69 participants recruited from Credamo (27.5% male; \(M_{\text{age}} = 30.58\) years) suggested a significant difference between the two appeals regarding their frames (\(M_{\text{prescriptive}} = 2.31, M_{\text{proscriptive}} = 5.79, t(67) = 8.788, p < .001\)), but no significant differences between the perceptions of the importance (\(M_{\text{prescriptive}} = 5.86, M_{\text{proscriptive}} = 6.03, t(67) = -.733, p > 0.1\)), credibility (\(M_{\text{prescriptive}} = 6.39, M_{\text{proscriptive}} = 6.24, t(67) = .762, p > 0.1\)) and understandability (\(M_{\text{prescriptive}} = 6.25, M_{\text{proscriptive}} = 6.67, t(67) = -1.924, p > 0.05\)).

Results of pilot study B suggested the manipulations of prescriptive and proscriptive-framed appeals were successful and could be applied in subsequent studies.

[Table 2.]

5. Study 1a

5.1. Research Design
This study employed a two-factor between-subjects design. A total of 315 participants (30.5% male; $M_{age} = 28.25$ years) were recruited through Credamo and randomly assigned to a 2 (context: tourism vs. daily) x 2 (pro-environmental appeal: prescriptive vs. proscriptive) scenario. Participants were thanked with a monetary incentive of 1 Chinese Yuan (approx. 0.15 US Dollars).

Participants were first asked to imagine their presence in a national park (vs. a street park) that they visit for the first time (vs. visit regularly). To prime the psychological distance, participants were presented with a picture of the assigned park and asked to rate their perception of the psychological distance of the park compared to their usual place of residence. They were then randomly assigned to read a notice framed as prescriptive or proscriptive and answered questions measuring their responses using the intention toward pro-environmental behavior question on a ten-item 7-point scale adopted from Cheng, Wu, and Huang (2013) and Halpenny (2010). The ten items (e.g., “I will not drop litter in the park” , and “I will pick up litter dropped by others”; 1 = strongly disagree, 7 = strongly agree; $\alpha = 0.76$) were averaged to form the index of participant response to the pro-environmental message. Finally, participants completed their demographic information.

5.2. Results

5.2.1. Manipulation check

The results of an independent sample t-test showed that the perceived psychological distance was significantly higher in the tourism context ($M_{tourism} = 5.98$) than in the daily context ($M_{daily} = 3.42$, $p < .001$), participants could successfully differentiate the two types of
appeals ($M_{\text{prescriptive}} = 2.33$; $M_{\text{proscriptive}} = 5.83$, $p < .001$). Both manipulations were demonstrated effective.

### 5.2.2. Hypothesis 1 testing

The result of a two-way ANOVA with age, gender, education, income, and travel experience as covariates showed only a significant interaction effect ($F(1, 311) = 34.18$, $p < .001$), and the main effects of message appeal and context were not significant ($p > .10$). Further analysis (see Figure 2) showed that in the tourism context, participants’ response to prescriptive-framed message appeal in terms of pro-environmental intention ($M_{\text{prescriptive}} = 6.03$) was higher than the proscriptive-framed message appeal ($M_{\text{proscriptive}} = 5.62$); while in the daily context, the response to the proscriptive-framed appeal in terms of pro-environmental intention ($M_{\text{proscriptive}} = 5.90$) was higher than the prescriptive-framed appeal ($M_{\text{prescriptive}} = 5.60$). These results supported H1.

### 5.3. Discussion

Study 1a provided initial evidence on the interaction effect between context and pro-environmental appeal. Given the tourism context of Study 1a is a nature-based attraction, a major concern lies in whether this interaction effect will happen in other kinds of tourism contexts. Individuals consume intangible experiences in tourism destinations but tangible services at hotels. Therefore, we replicated our research in Study 1b where a hotel was selected as the tourism context.

[Figure 2.]
6. Study 1b

6.1. Research Design

Study 1b also employed a two-factor between-subjects design. A total of 180 participants (44.4% male; \text{M}_{\text{age}} = 28.48 \text{ years}) were recruited through Credamo and were randomly assigned to one of the 2 (context: hotel vs. office) x 2 (pro-environmental appeal: prescriptive vs. proscriptitve) scenarios.

Participants were first asked to imagine they were at work or in a hotel, with pictures presenting either an office or a chain hotel. After that, they answered a manipulation check question, “How likely are you to be in the current environment compared with your usual place of residence?” (1 = not likely, 7 = very likely). Then, they were randomly shown with a water conservation appeal framed as prescriptive or proscriptive. They answered the items on their intention toward water conservation behavior on a 4-item 7-point scale adopted from H. Han and Hyun (2018) (e.g., “I will turn off the tap water while I am soaping”, and “I will expand effort on conserving water”; 1 = strongly disagree, 7 = strongly agree; \alpha = 0.66). The four items were averaged to form the index of the intention of water conservation behavior. Finally, participants completed their demographic information and were thanked for their participation with the monetary incentive of 1 yuan.

6.2. Results

6.2.1. Manipulation check
The result of an independent sample t-test showed that the tourism context was perceived to be psychologically more distant ($M_{\text{tourism}} = 5.11$) than the daily context ($M_{\text{daily}} = 6.19$, $p < .001$). Participants rated the prescriptive appeal to be more prescriptive-framed ($M_{\text{prescriptive}} = 1.77$) than the proscriptive appeal ($M_{\text{proscriptive}} = 5.57$, $p < .001$). The manipulations of the context and pro-environmental appeal were both successful.

6.2.2. Water conservation

The results of a two-way ANOVA with age, gender, education, income and travel experience as covariates showed only a significant interaction effect ($F(1, 176) = 20.31$, $p < .001$), and the main effects of water conservation appeal and context were not significant ($p > .10$). Further analysis (see Figure 3) showed that in the tourism context (the hotel), the participants presented with a prescriptive-framed appeal were more willing to conserve water ($M_{\text{prescriptive}} = 6.41$) than those with the proscriptive-framed appeal ($M_{\text{proscriptive}} = 6.09$); while in the daily context (the office), the participants who read a proscriptive-framed appeal showed a higher intention of water conservation ($M_{\text{proscriptive}} = 6.45$) than those who read the prescriptive-framed one ($M_{\text{prescriptive}} = 5.97$).

6.3. Discussion

The results of Study 1b were consistent with those of Study 1a. The conclusion that we drew from a park scenario could be successfully generalized to a hotel scenario, demonstrating the external validity of our findings. The interaction effect between context
and pro-environmental appeal was robust across the tourism and daily contexts. So far, these results have supported H1.

[Figure 3.]

7. Study 2

7.1. Research Design

A total of 161 participants (38.5% male; Mage = 28.81 years) were recruited via Credamo and randomly assigned to a 2 (context: tourism vs. daily) x 2 (pro-environmental appeal: prescriptive vs. proscriptive) between-subjects experiment design in exchange for a monetary incentive of 2 Chinese Yuan.

The experiment stimuli and procedures were identical to those of Study 1a. Participants also answered anticipated pride on a 4-item scale (Imagine you follow the appeal and protect the environment, how would you feel? [1]proud, [2]accomplished, [3]confident, [4]worthwhile; 1 = not at all, 7 = very much; α = 0.79) and anticipated guilt on a 3-item scale (Imagine you don’t follow the appeal and fail to protect the environment, how would you feel? [1]guilty, [2]sorry, [3]bad; 1 = not at all, 7 = very much; α = 0.79). Both scales were adopted from H. Han and Hyun (2016).

Furthermore, to eliminate alternative mechanisms, we consider other potential mediators. In daily life, social norms that reflect people’s conformity to collective standards (Ajzen, 1991) and social pressures (Steg, Dreijerink, & Abrahamse, 2005) play a significant role. Proscriptive appeals that emphasize not crossing the line are more persuasive in this context.
On the other hand, in the tourism environment, people are motivated by their personal beliefs about performing a specific action and are thus more likely to be persuaded by prescriptive appeals that imply providing help. From an efficacy-based perspective, the avoidance actions suggested by proscriptive appeals require less effort to follow and are easier to achieve, leading to greater self-efficacy (feasibility). In contrast, the approach goals reflected in prescriptive appeals make people feel more impactful, resulting in a higher perception of response efficacy (desirability). The increase in construal level redirects people's attention from feasible outcomes to desired results (D. Han, Duhachek, & Agrawal, 2016). Therefore, the favorable response of individuals to proscriptive appeals in daily life and prescriptive appeals in the tourism context could be mediated through different types of efficacy. Finally, the framing-context congruency effect could be driven by processing fluency, which is a common mediator in the matching effect of message-framing research (White, Habib, & Hardisty, 2019). The higher persuasion of appeals in each context may simply be a result of the fluency with which the message is processed.

Overall, in Study 2, we replicated the findings of Study 1a and 1b and tested anticipated pride and anticipated guilt as our proposed mediators, along with alternative mediators. Alternative mediators of personal norm and social norm, self-efficacy and response efficacy, and processing fluency were accessed using scales adopted from H. Han, Hwang, Lee, and Kim (2019), D. Han, Duhachek, and Agrawal (2016) and White, Macdonnell, and Dahl (2011).

7.2. Results
7.2.1. **Manipulation check**

The results of an independent sample t-test showed that both context and pro-environmental appeal were successfully manipulated. The environmental difference was significantly higher in the tourism context ($M_{\text{tourism}} = 6.29$) than in the daily context ($M_{\text{daily}} = 3.12$, $p < .001$), and appeal framed as prescriptive was perceived to be more prescriptive than appeal framed as proscriptive ($M_{\text{prescriptive}} = 1.76; M_{\text{proscriptive}} = 6.11$, $p < .001$).

7.2.2. **Hypothesis 1 testing**

Consistent with our previous finding, the results of a two-way ANOVA with gender, age, education, income and travel experience controlled showed only a significant interaction effect ($F(1, 157) = 14.01$, $p < .001$), and the main effects of message appeal and context were not significant ($p > .05$). Further analysis (see Figure 4) showed that in the tourism context, participants’ response to prescriptive-framed message appeal in terms of pro-environmental intention ($M_{\text{prescriptive}} = 6.04$) was higher than proscriptive-framed appeal ($M_{\text{proscriptive}} = 5.51$); while in the daily context, participants’ response to the proscriptive-framed appeal in terms of pro-environmental intention ($M_{\text{proscriptive}} = 5.89$) was higher than the prescriptive-framed message appeal ($M_{\text{prescriptive}} = 5.61$). H1 was again supported.

7.2.3. **Moderated mediation**

To examine whether anticipated emotions mediate the effect of the interaction between context and pro-environmental appeal on participants’ response (H2), the moderated
mediation analysis using the Bootstrapping analysis (SPSS PROCESS Model 8) based on 5000 samples was conducted (Hayes, 2013). Findings indicated that in the tourism context, the indirect effect of the two-way interaction on pro-environmental behavior through anticipated pride was significant \((a \times b = .29, 95\% \text{ confidence interval [CI]}: -.46, -.13)\) while the indirect effect through anticipated guilt was not \((a \times b = -.02, 95\% \text{ CI: } -.15, .12)\). The index of moderated mediation was 0.27 (95\% CI: .09, .50); while in the daily context, the indirect effect through anticipated guilt was significant \((a \times b = .16, 95\% \text{ CI: } .05, .32)\), but the indirect effect through anticipated pride was not \((a \times b = -.05, 95\% \text{ confidence interval [CI]}: -.14, .02)\). The index of moderated mediation was 0.22 (95\% CI: .07, .41). These results supported H2.

The mediating effects of processing fluency (Index = -.05, 95\% CI: -.17, .08), personal norm (Index = .22, 95\% CI: -.03, .57) and social norm (Index = .15, 95\% CI: -.14, .49), self-efficacy (Index = .03, 95\% CI: -.13, .21) and response efficacy (Index = .03, 95\% CI: -.22, .31) were not significant, thus, all alternative mediators were excluded.

7.3. Discussion

The empirical results confirmed that the interaction between context and message appeal on participants’ response was mediated by anticipated pride in the tourism context and by anticipated guilt in the daily context respectively.

8. Discussion and Conclusions
Message framing is an important tool used in pro-environmental communication. This research investigates the relative effectiveness of the two types of message framing: prescriptive versus proscriptive appeal in the contexts of home and away. The results show that in the tourism context, the prescriptive-framed appeal is more effective than the proscriptive-framed appeal, while in the daily context, the proscriptive-framed appeal is more effective than the prescriptive-framed appeal. The research shows that anticipated pride and anticipated guilt mediate the interactive effect between pro-environmental appeal and context. These findings have both theoretical and practical implications.

8.1. Theoretical contributions

This research expands on previous studies examining the effectiveness of positive and negative framing in pro-environmental appeals (Olsen, Slotegraaf, & Chandukala, 2014; White, Macdonnell, & Dahl, 2011). By focusing on the effectiveness of prescriptive and proscriptive appeals, which have received limited attention in existing research (Smith et al., 2012; White & Simpson, 2013; Zhang et al., 2023), this study offers new insights into the effectiveness of different framing strategies within different contexts. Our findings contribute to a deeper understanding of aligning pro-environmental communication with the context to enhance its effectiveness.

Our study contributes to the understanding of persuasive message framing by considering the interaction between the context and pro-environmental appeals. By leveraging the construal level theory (Trope, Liberman, & Wakslak, 2007), we demonstrate that aligning the framing of pro-environmental appeals with the construal level of the context
enhances their persuasion effect. Specifically, in the distal tourism context, where individuals exhibit a higher construal level, prescriptive appeals are more effective. In contrast, in the proximal daily context characterized by a lower construal level, proscriptive appeals are more effective. Advancing the existing research on the impact of tourism as an unusual environment (Li, Wang, & Li, 2022; Li et al., 2021), we identify psychological distance as a core distinguishing factor between tourism and daily life. Our findings contribute to a deeper understanding of the dualistic conceptualizations prevalent in tourism, such as home/away, host/guest, self/other, and novelty/familiarity (White & White, 2007), and how psychological distance shapes individuals’ perceptions, motivations, judgments, and decision-making processes in tourism.

Moreover, our research directly addresses the long-standing issue of inconsistent behaviors at home and away, which has been a subject of concern in the tourism literature (Dolnicar & Grün, 2009; Holmes, Dodds, & Frochot, 2019; Line, Hanks, & Miao, 2017). The influence of contextual factors on pro-environmental behavior has garnered increasing attention in recent literature (Qin & Hsu, 2022; Wu, Font, & Liu, 2021). The inconsistency between individuals’ environmentally friendly behavior in their daily lives and their behavior while traveling has been a challenge for interventions aiming to promote sustainable practices (Dolnicar, Knezevic Cvelbar, & Grün, 2017). There has been a lack of effective interventions that can effectively target tourists' indulgent behavior (Qin & Hsu, 2022). By examining the alignment of pro-environmental communication with context, our research offers a promising approach to addressing this issue.
Furthermore, our research reveals anticipated moral emotions specifically anticipated guilt and pride (White, Habib, & Hardisty, 2019) as a key mechanism in pro-environmental communication effectiveness. Traditionally, drivers of pro-environmental behavior have been categorized into cognitive (e.g., norms and values) and affective factors (e.g., emotions) (Ru et al., 2018). Our research goes beyond this framework by examining and ruling out alternative mediators such as norms, efficacy, and processing fluency, and suggests that affective factors play a stronger role in shaping the effectiveness of pro-environmental communication compared to cognitive factors. This is in contrast to the findings of Schneider et al. (2017), which indicated that anticipated pride leads to higher pro-environmental motivation. Our research demonstrates that both positive and negative dimensions of anticipated affect directly contribute to the effectiveness of pro-environmental communication but through different routes depending on the context. Specifically, anticipated guilt is more influential in the daily context, while anticipated pride is more effective in the tourism context. These findings provide a nuanced understanding of the effectiveness of pro-environmental communication and contribute to the ongoing efforts in the sustainability literature to develop more impactful interventions that can effectively promote pro-environmental behaviors in different contexts (Holmes, Dodds, & Frochot, 2019; Yang et al., 2023).

8.2. Practical implications

This research identifies effective pro-environmental communication strategies that successfully induce an individual’s pro-environmental response in the home versus away
context. Our findings offer significant managerial implications for tourism and hospitality managers.

First, our findings highlight the differences in appeal effectiveness between tourism and daily life contexts. Managers can optimize their pro-environmental campaigns and encourage more sustainable behaviors effectively by developing appropriate pro-environmental appeals that fit the context. In the tourism context, using prescriptive-framed appeals that emphasize the positive outcomes of pro-environmental behaviors could be more effective. On the other hand, in the daily context, focusing on proscriptive-framed appeals that highlight the negative consequences of not engaging in pro-environmental behaviors might be more persuasive. Simply put, in the tourism context, pro-environmental appeals should be organized in a “should” frame (such as “keep off the grass” or “be smoke-free”), while in the daily context, pro-environmental appeals should be organized in a “should not” frame (such as “don’t step on the grass” or “no smoking”).

In addition, campaign managers can identify target audiences more accurately by considering whether they are in a tourism-related setting or their daily lives, and tailor their campaigns accordingly to engage each group effectively. When targeting tourists or travelers, the campaign can center on how their pro-environmental actions can contribute to the preservation of natural landscapes and local communities. In contrast, when targeting daily behaviors, the campaign can focus on the potential harm that unsustainable practices may cause to the environment and the necessity of making eco-friendly choices. Furthermore, managers in the tourism and hospitality industries can incorporate prescriptive-framed
appeals in their communications to encourage sustainable practices among tourists. In daily life settings, managers can use proscriptive-framed appeals to design behavioral nudges that prompt people to adopt eco-friendly habits.

Second, according to our findings, anticipated pride and anticipated guilt play a mediating role in influencing the effectiveness of pro-environmental behavior. Therefore, managers should leverage emotional responses to messaging as a powerful tool in encouraging pro-environmental behaviors in both tourism and daily life contexts. For example, managers can design pro-environmental campaigns that intentionally evoke anticipated pride in the tourism context and anticipated guilt in the daily context. Additionally, highlighting the positive behaviors of others in similar contexts can further enhance anticipated pride in tourism settings and anticipated guilt in daily life.

For tourism-related businesses, emphasizing how sustainable actions contribute to the conservation of local environments and cultural heritage can increase anticipated pride and encourage responsible tourism. Eco-tourism packages can be designed to evoke anticipated pride through responsible travel practices. Lastly, when assessing the effectiveness of pro-environmental appeals, managers can measure the levels of anticipated pride and anticipated guilt among their target audience.

8.3. Limitations and further research

This research has several limitations that should be acknowledged. First, our study was restricted to park and hotel/office settings, which may limit the generalizability of our
findings to other contexts in the tourism and hospitality industry such as restaurants, museums, and amusement parks. To address this limitation, future research could include these additional contexts to broaden the applicability of our findings. Second, our study focused on the individual level without taking into account social psychological factors. Studies have examined pro-environmental behavior in group package tours where factors such as the presence of others, the diffusion of responsibility (Wu, Font, & Liu, 2020) and the signaling effect may become relevant. To address this limitation, future research should incorporate these social psychological factors. Third, some tourism products are psychologically further by nature, resulting in a higher construal level among tourists (Scarpi & Raggiotto, 2023). Future research could investigate the framing effect of prescriptive versus proscriptive appeals in varied tourism contexts. Last, our study only examined behavior intentions, and given the well-established intention-behavior gap, future studies should measure actual behaviors as the outcome variable to gain a more comprehensive understanding of the effectiveness of pro-environmental communication.
Appendix A. Stimuli

Context: street park vs. national park (Study 1a and Study 2)

Context: office vs. hotel (Study 1b)

Pro-environmental appeal: prescriptive vs. proscriptive (Study 1a and Study 2)

Water conservation appeal: prescriptive vs. proscriptive (Study 1b)
Please save water

Please don’t waste water
## Appendix B. Measurement items

<table>
<thead>
<tr>
<th>Study</th>
<th>Variable</th>
<th>Item</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot study A</td>
<td>Perceived psychological distance</td>
<td>How far is the current environment from your usual place of residence?</td>
<td>Zhang and Wang (2009)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>How likely are you to be in the current environment compared with your usual place of residence?</td>
<td></td>
</tr>
<tr>
<td>Pilot study B</td>
<td>Prescriptive/proscriptive</td>
<td>To what extent does the appeal focus on what should be done (the prescriptive side)? / To what extent does the appeal focus on what should not be done (the proscriptive side)?</td>
<td>Janoff-Bulman, Sheikh, and Hepp</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1 = prescriptive, 7 = proscriptive)</td>
<td>(2009)</td>
</tr>
<tr>
<td>Study 1a</td>
<td>Intention of pro-environmental behavior</td>
<td>I will follow the legal ways to stop visiting the closed area in the park</td>
<td>Cheng, C. Wu, and Huang (2013);</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I will volunteer to stop visiting a favorite spot in the park if it needs to recover from environmental damage</td>
<td>Halpenny (2010)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I will not litter at the park</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I will try to convince partners to not litter at the park</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I will follow the legal ways to stop the destruction of the environment of the park</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I will learn more about the park’s natural environment</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I will discuss with people the issues of environmental protection of the park</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I will volunteer my time to projects that help the park or similar parks and nature areas</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I will donate to ensure the protection of the park</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I will pick up litter at the park left by other visitors</td>
<td></td>
</tr>
<tr>
<td>Study 1b</td>
<td>Water conservation behavior</td>
<td>I turn off the tap water while I am soaping.</td>
<td>H. Han and Hyun (2018)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I am willing to conserve water.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I plan to engage in water conservation activities.</td>
<td></td>
</tr>
<tr>
<td>Study 2</td>
<td>Anticipated pride</td>
<td>Anticipated guilt</td>
<td>Personal norm</td>
</tr>
<tr>
<td>---------</td>
<td>-------------------</td>
<td>-------------------</td>
<td>---------------</td>
</tr>
<tr>
<td></td>
<td>(1 = not at all, 7 = very much)</td>
<td>(1 = not at all, 7 = very much)</td>
<td>(1 = strongly disagree, 7 = strongly disagree)</td>
</tr>
<tr>
<td></td>
<td>I will expend effort on conserving water.</td>
<td>Guilty</td>
<td>I feel an obligation to choose a sustainable way of using the park.</td>
</tr>
<tr>
<td></td>
<td>Proud</td>
<td>Sorry</td>
<td>Regardless of what other people do, because of my own values/principles, I feel that I should behave in an environmentally friendly way while visiting the park.</td>
</tr>
<tr>
<td></td>
<td>Accomplished</td>
<td>Bad</td>
<td>I feel that it is important to make the park environmentally sustainable, reducing the harm to the environment.</td>
</tr>
<tr>
<td></td>
<td>Confident</td>
<td></td>
<td>I feel it is important that park visitors in general make an eco-friendly decision while visiting the park.</td>
</tr>
<tr>
<td></td>
<td>Worthwhile</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

H. Han and Hyun (2016)  
H. Han, et al. (2019)  
D. Han, Duhachek, and Agrawal (2016)
<table>
<thead>
<tr>
<th>Question</th>
<th>Response Efficacy (1 = not at all, 7 = very much)</th>
<th>Processing Fluency (1 = not at all, 7 = very much)</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>How confident are you to maintain your environmental practice every day by following the appeal?</td>
<td>To what extent do you think this appeal can prevent you from damaging the environment?</td>
<td>Difficult to process.</td>
<td>White, Macdonnell, and Dahl (2011)</td>
</tr>
<tr>
<td>How confident are you in reminding your friends to engage in pro-environmental behavior proposed by the appeal?</td>
<td>To what extent do you think the following actions suggested by this appeal can reduce the environmental threat faced by the park?</td>
<td>Difficult to understand.</td>
<td></td>
</tr>
<tr>
<td>To what extent do you think this appeal can prevent environmental problems?</td>
<td>To what extent do you think the following actions suggested by this appeal can reduce the environmental threat faced by the park?</td>
<td>Difficult to comprehend.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix C. Scenarios

Tourism context: national park

Imagine that you are traveling to a national park far from your daily place of residence, beautiful and scenic, which you have planned to visit with your friends and family. At this moment, you see that there is a sign on the grassland of the park.

Daily context: street park

Imagine that you are relaxing at a street park near your home, beautiful and scenic, where you often come to relax with your friends and family. At this moment, you see that there is a sign on the grassland of the park.

Tourism context: hotel

Imagine that you are on a tour and staying at a hotel. Entering the bathroom, you see a sign posted on the wall with a water conservation appeal message.

Daily context: office

Imagine that you are at work and stay in the office. Entering the bathroom, you see a sign posted on the wall with a water conservation appeal message.
References


Table 1. Overview of the Studies.

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample</th>
<th>Purpose</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot</td>
<td>Credamo participants (N=120; study 1 56)</td>
<td>The manipulation of the context (tourism; hospitality)</td>
<td>Independent sample t-test</td>
</tr>
<tr>
<td>Pilot</td>
<td>Credamo participants (N=120; study 2 69)</td>
<td>The manipulation of the pro-environmental appeal (environment protection; water conservation)</td>
<td>Independent sample t-test</td>
</tr>
<tr>
<td>Study</td>
<td>Credamo participants (N=315)</td>
<td>H1 (tourism)</td>
<td>Two-way ANOVA</td>
</tr>
<tr>
<td>Study</td>
<td>Credamo participants (N=180)</td>
<td>H1 (hospitality)</td>
<td>Two-way ANOVA</td>
</tr>
<tr>
<td>Study</td>
<td>Credamo participants (N=161)</td>
<td>H2</td>
<td>Two-way ANOVA and Hayes PROCESS Model 8</td>
</tr>
<tr>
<td>Variable</td>
<td>Study 1a (N=315)</td>
<td>Study 1b (N=180)</td>
<td>Study 2 (N=161)</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>------------------</td>
<td>------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>P%</td>
<td>N</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>96</td>
<td>30.5</td>
<td>80</td>
</tr>
<tr>
<td>Female</td>
<td>219</td>
<td>69.5</td>
<td>100</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17-19</td>
<td>20</td>
<td>6.3</td>
<td>7</td>
</tr>
<tr>
<td>20-34</td>
<td>240</td>
<td>76.2</td>
<td>136</td>
</tr>
<tr>
<td>35-44</td>
<td>31</td>
<td>9.8</td>
<td>29</td>
</tr>
<tr>
<td>45-55</td>
<td>21</td>
<td>6.7</td>
<td>8</td>
</tr>
<tr>
<td>&gt;55</td>
<td>3</td>
<td>1.0</td>
<td>0</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Junior high school or below</td>
<td>1</td>
<td>0.3</td>
<td>1</td>
</tr>
<tr>
<td>High school</td>
<td>12</td>
<td>3.8</td>
<td>7</td>
</tr>
<tr>
<td>University or college</td>
<td>264</td>
<td>83.8</td>
<td>150</td>
</tr>
<tr>
<td>Postgraduate or above</td>
<td>38</td>
<td>12.1</td>
<td>22</td>
</tr>
<tr>
<td>Monthly disposable income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1000</td>
<td>15</td>
<td>4.8</td>
<td>7</td>
</tr>
<tr>
<td>1000-1999</td>
<td>65</td>
<td>20.6</td>
<td>30</td>
</tr>
<tr>
<td>2000-4999</td>
<td>90</td>
<td>28.6</td>
<td>39</td>
</tr>
<tr>
<td>5000-9999</td>
<td>102</td>
<td>32.4</td>
<td>68</td>
</tr>
<tr>
<td>&gt;9999</td>
<td>43</td>
<td>13.6</td>
<td>36</td>
</tr>
<tr>
<td>Travel frequency of last year (mean)</td>
<td>1.97 (sd=1.68)</td>
<td>2.77 (sd=1.79)</td>
<td>2.24 (sd=1.53)</td>
</tr>
</tbody>
</table>
Figure 1. Conceptual model.
Figure 2. Interaction effect between context and pro-environmental appeal on the intention of pro-environmental behavior (Study 1a).
Figure 3. Interaction effect between context and pro-environmental appeal on the intention of water conservation behavior (Study 1b).
Figure 4. Interaction effect between context and pro-environmental appeal on pro-environmental behavior intention (Study 2).
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