

# Explaining littering prevention among park visitors using the Theory of Planned Behavior and Norm Activation Model

*by Nisful Laila*

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### Research Paper

# Explaining littering prevention among park visitors using the Theory of Planned Behavior and Norm Activation Model



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### ABSTRACT

The increasing concern for environmental issues and degradation has gained much attention over the past few decades. Tourist destinations and natural areas are vulnerable to human-caused environmental problems such as littering. This study examines the factors that determine and shape environmentally responsible intended behavior, specifically preventing littering of natural park visitors. The present study integrated the Theory of Planned Behavior and the Norm Activation Model. The hypothesis was tested using a survey of 328 individuals who visited Mount Merapi National Park, Indonesia. The structural equation modeling result showed that attitude and perceived behavior control are positively linked to intended behavior. Despite the research's findings, an individual's commitment to environmentally friendly behavior would not be driven by personal subjective norms. By accepting responsibility, one develops personal norms that urge one to be more aware of the consequences of one's actions. Personal norms also significantly impact perceptions of behavioral control, attitude, and subjective norms. The result adds to the body of literature regarding visitors to national parks. Furthermore, this study outlines the power of personal norms on the constructs of the Theory of Planned Behavior (perceived behavioral control, attitude, and subjective norm). There is a discussion of the study's potential real-world applications and its directions for further research.

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## 1. Introduction

During the past few decades, environmental degradation has been considered a critical challenge worldwide. Tourism destinations and national parks face significant problems resulting from human activities, such as environmentally irresponsible and vandalism behavior (Wu, Lin, & Liu, 2020). This behavior includes littering, "trash, discarded or scattered about in disorder over a socially inappropriate area" (Robinson, 1976). Generally, littering is a global problem. Indeed, in Indonesia, littering is an urgent issue that is seen as a significant source of socio-environmental and economic problems (Purba et al., 2019; Thøgersen, Zhou, & Huang, 2016). This behavior is considered harmful and irresponsible, which causes several problems in many tourist areas in

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Indonesia (Cahyadi & Newsome, 2021). The consequences not only impact the environment but also harm human, animal, and economic health and the livelihood of the community in the area (Purba et al., 2019).

The Indonesian government has taken substantial practical measures to address the critical damage to tourist destinations. The Indonesian authorities considered national policies and regulations regarding the waste problem. This initiative aims to reduce waste by 70% by 2025. Besides, some actions were considered to reduce the impact of the littering problem, including raising awareness through campaigns and beach clean-up in many areas and regulation enforcement. Stakeholder involvement and engagement also play a significant role in tackling this issue in Indonesia. However, the lack of an effective waste management system, concrete long-term strategies, and lack of public involvement participating in littering prevention delay its success. Notwithstanding, there is not enough knowledge regarding what makes individuals and the public participate in reducing littering and its consequences. Since the littering problem in tourism is linked to tourist behavior, it is crucial to understand their motivations and antecedents while visiting a particular setting.

Environmentally responsible behavior refers to the behaviors practiced by individuals or groups of tourists. According to Lee and associates in the tourism context, the definition of tourists of environmentally responsible behavior are tourists “who reduce environmental impacts, contribute to conservation efforts, and therefore do not harm a destination’s ecosystem and biosphere” (Lee, Jan, & Yang, 2013). Several scholars have raised their attention to understanding this phenomenon and identifying its antecedents from various perspectives, including environmental, economic, psychological, and behavioral approaches (Almosa, Parkinson, & Rundle-Thiele, 2017; Chaudhary, Polonsky, & McClaren, 2021). The Norm Activation Model (NAM), Value-Belief-Norm (VBN) (Kiatkawsin & Han, 2017; Le et al., 2021; Trautwein, Babazade, Trautwein, & Lindenmeier, 2021), and the Theory of Planned Behavior (TPB) (Fenitra, Handriana, Gancar, Usman, & Hartini, 2021; Ojedokun, Henschel, Arant, & Boehnke, 2022; Panwanitdumrong & Chen, 2021) have been widely employed to identify the antecedents of littering prevention behavior. These researchers concluded that awareness, the ascription of responsibility, personal norm, subjective norm, perceived behavior control, and attitude are essential antecedents that explain environmentally responsible intended behavior. The strong influence of personal norms on intended behavior and the influence of attitude, subjective norm, and perceived behavior control on intended behavior has been widely explored in the context of environmentally responsible behavior. However, these links are only partially understood comprehensively or simultaneously. For example, Zhang, Popa, Sun, Guo, and Meng (2022) attempted to understand this phenomenon using the NAM and TPB. However, the interaction between these two theories and the constructs needed to be explained. Though Zhang et al. acknowledge in their study that they should have accounted for the relationship between all elements, including the subjective norm link to the personal norm, we cannot commend their work due to this limitation and less generalizability. Besides, Park and Ha (2014) urged future research to investigate the role of responsibility attribution, an aspect of NAM, since they did not do so in their work. There should be a thorough examination of how ascribed responsibility functions in combination with this model because there are divergent views regarding its function (see additionally Black, Stem, & Elworth, 1985; Osterhus, 1997).

Moreover, Esfandiar, Pearce, and Dowling (2019); Esfandiar, Dowling, Pearce, and Goh (2021) integrated the TPB and NAM to provide a solution to the litter problem in the national parks in Iran. Since their findings cannot be generalized to all settings and conditions, thus, it allows the development of an alternative model to explain littering prevention in the Indonesian context; moreover, despite the potential mediation role of the Theory of Planned Behavior’s constructs in the relationship between intended behavior and personal norms, intended behavior remains unexplored in this context (Han, 2020; Tuhiin, Miraz, Habib, & Alam, 2022). Though, such knowledge is crucial in designing and promoting environmentally responsible behavior. Most past research in this area was done in industrialized nations where people are more environmentally conscious. The research of Shin, Im, Jung, and Severt (2018) was examined, and it revealed that there was no apparent connection between perceived behavioral control and personal norm. However, a combined model of these two characteristics was used in this work. They should have specified a period for their research when gauging customers’ intentions. Testing the model in various scenarios of customers’ pro-environmental behavior can help increase the model’s validity which is filled in this paper.

Further, Shin et al. (2018) investigated how cultural circumstances may affect individuals’ beliefs and reasons for eating behaviors, as people were likely to have varied perceptions and requirements which were influenced by their culture. For this reason, this work studies the intended behavior toward environmentally responsible of park visitors in the context of Indonesia. Researchers noticed that awareness of the environmental problem had slightly different characteristics (Qiu, Zhang, & Zheng, 2018). However, studies in the context of developing countries need to be better-explored (Chaudhary et al., 2021; Maminirina, Candra, Sedera, Abbas, & Laila, 2022). In addition, there are also inconsistencies in the prior findings (Fenitra, Handriana, et al., 2021; Ghazali, Mutum, Waqas, Nguyen, & Ahmad-Tamizi, 2022; Ibnou-laaroussi & Rjoub, 2020; Maminirina et al., 2022).

In a developing country like Indonesia, infrastructure and means to resolve the consequences of litter are still low. Understanding what factors influence an individual to participate in littering prevention is essential in tackling this issue in advance. Natural areas and destinations, including national parks, are the most vulnerable to the consequence of litter (Cahyadi & Newsome, 2021). This study was carried out to provide a practical explanation for the expected ecologically responsible behavior. Specifically preventing littering in national parks in Indonesia, the authors intend to advance and determine the applicability of these theories in this context. This study attempts to thoroughly understand the tourists’ rational and moral aspects and examine the mediation role of the Theory of Planned Behavior constructs. This study integrated the Theory of Planned Behavior and Norm Activation Model to explain environmentally responsible behavior, better understand this issue, and view the phenomenon from multiple perspectives. This work further examines how both theories interact and examines the mediating role of subjective norm, attitude, and perceived behavior in the relationship between personal norm and intended behavior. Besides, the aim is to improve



the predictive power of intentional, ecologically responsible conduct. This study also aims to understand how these two theories interacted. This work hopes to fill the gap and broaden the literature on this topic, particularly from developing countries' perspectives. In addition to the theoretical contributions of this work, the result would be an asset and additional tools for practitioners in designing littering prevention campaigns, policies, and strategies.

## 2. Literature review

### 2.1. Theory of Planned Behavior and Norm Activation Model

The Theory of Planned Behavior is widely used to study and understand human behavior. This theory is one of the most prominent theories in psychology. It has been implied across disciplines, including organizational behavior, social psychology, consumer behavior, marketing, and tourism (Bosnjak, Ajzen, & Schmidt, 2020; Fenitra, Handriana, et al., 2021). The significance of this theory in explaining pro-environmental, environmentally responsible, and eco-friendly behavior has been tested in the tourism context. The Theory of Planned Behavior is extended from the Theory of Reasoned Action, which suggests that one's behavior is determined by intention, and intention is fostered by attitude and subjective norms. Later, perceived behavior control was incorporated into the Theory of Planned Behavior. Besides, the Norm Activation Model widely employs an understanding of altruistic, prosocial, and pro-environmental behavior in various fields. This model proposes that personal norm enhances pro-environmental behavior (Schwartz, 1977; Schwartz & Howard, 1981). This Norm Activation Model consists of antecedents to predict behavior: awareness of consequences, an ascription of responsibility, and personal norm that shapes environmental responsible behavior intention. Personal norm is the core factor that shapes behavior. This model has been widely used to explain the link between morality and environmentally responsible behavior.

Some scholars have integrated the Theory of Planned Behavior and the Norm Activation Model to explain environmentally responsible behavior. Every activity that promotes (either prevents or causes) undesirable outcomes are included. This type of behavior can be viewed by self-interest or pro-social motives (Bamberg, Hunecke, & Blöbaum, 2007). Thus, integrating the Theory of Planned Behavior and the Norm Activation Model allows researchers to simultaneously understand this phenomenon from two angles. In this study, environmentally responsible behavior conceptualizes littering prevention.

Further, littering prevention intentions are the intended action of an individual to participate in or minimize littering by reducing the amount of litter and disposing of it properly. This notion has been used in a similar study that focused on the environmentally friendly habits of parkgoers. Esfandiar et al. (2021) study focused on high-effort pro-environmental behavior and conducted in a setting where visitors/people had a higher level of environmental awareness (Australia). Han and Hyun (2017b) merged the Theory of Planned Behavior and the Norm Activation Model to explain this phenomenon in the museum. The study was conducted in a particular setting where visitors were more aware of conservation and environmental protection. Also, they were more exposed to such regulations and guidelines for responsible behavior. As a consequence, their results could not be generalized to all settings. Hence, it is essential to adopt this model in different environmental conditions.

### 2.2. Attitude and intended behavior

Attitude refers to one's general evaluation or perception of a particular object, subject, and behavior. It can be positive or negative, like or unlike, and favorable or unfavorable (Ajzen & Fishbein, 1974). Scholars have established that this construct is associated with intended behavior. When a person has a very positive attitude about anything, the likelihood of acting under that object or even with their attitude toward it increases. This is because having a positive attitude about something makes it more likely that they will act. Earlier research has shown that having a positive attitude correlates directly to offering enhanced behavioral intentions. Panwanitdumrong and Chen (2021) asserted that a person with a positive evaluation of reducing marine litter would intend to participate in a particular behavior. The results explain that when tourists have a desirable attitude toward environmentally responsible, they deliberately engage in reducing marine litter. Besides, the positive impact and influence of attitude on intention have been validated by various scholars in different contexts and settings. For example, Safshekan, Ozturen, and Ghaedi (2020) empirically confirmed that attitude strongly predicts an individual's intention using data from a survey of 300 Cypriots residing in Famagusta. Also, Ojedokun (2011) emphasized that robust positive evaluations of littering prevention increased Nigeria's intention to participate in littering prevention. In addition, Sia and Jose (2019) found that personal norm mediated the relationship between attitude and intention to build eco-friendly houses in Kerela. Therefore, the above evidence follows that increasing positive attitudes toward littering prevention among national park visitors would increase their intention to prevent littering in the area. We propose the hypothesis ( $H_1$ ) below.

$H_1$ : Attitudes have a significant positive effect on environmentally responsible intended behavior.

### 2.3. Subjective norm and intended behavior

Subjective norms refer to an individual's perception of the relationship between a specific type of behavior and the reference group's evaluation of this behavior (Ajzen, 1991). People can be influenced by how people who are important to them think about them and want them to do so, and push them to do it accordingly. According to Ajzen (1991), the subjective norm is related to the intangible benefit called normative reward that individuals obtain by engaging in a particular action. Numerous empirical

studies demonstrate a link between subjective norms and intended behavior. This causal relationship is positive, and the effect of subjective norms on intended behavior is significant. For example, Onel and Mukherjee (2017), Panwanitdumrong and Chen (2021) argued that subjective norms positively affected intended behavior toward litter mitigation and were environmentally sensitive. In tourism research, Hu, Zhang, Wang, Yu, and Chu (2019) surveyed 372 tourists in China to understand the factors that shaped tourists' pro-environmental intended behavior. The study emphasized that subjective norms were among the essential factors that increase tourists' intention to reduce their environmental footprint. Likewise, Liu, Wu, and Che (2019) revealed that tourists were willing to be involved in environmentally responsible behavior if they had a positive perspective on the behavior.

Similarly, Doran and Larsen (2016) found that injunctive social norms or subjective norms influenced behavioral intention. Correspondingly, social pressure encourages individuals to act more environmentally responsibly. These forces direct them to participate in reducing the damage to the environment when visiting natural-based destinations, including national parks. Hence, based on the above arguments and empirical findings, higher subjective norms lead to a higher intended behavior toward littering prevention. We propose the hypothesis ( $H_2$ ) below.

$H_2$ : Subjective norms have a significant positive effect on environmentally responsible intended behavior.

#### 2.4. Perceived behavior control and intended behavior

It is well-accepted that perceived behavioral control is a critical component in determining intention. This construct refers to one's perception and ability, capability, and control over action (Zhang, Moyle, & Jin, 2018). In other words, when individuals have a higher degree of perceived behavior control, they believe they can act or engage in a particular behavior anywhere and at any given time. Studies in various contexts have identified a significant link between perceived behavior control and intended behavior. In tourism research, perceived behavior control has been confirmed to positively influence intended behavior (Panwanitdumrong & Chen, 2021). For example, Hu et al. (2019) found that perceived behavior control had a significant positive impact on the intention to bring self-litter down from the mountain.

Similarly, in a study on littering prevention conducted in Nigeria, Ojedokun et al. (2022) outlined that perceived behavior control determined littering behavior. This study, therefore, suggested that higher perceived behavior control will enhance intended behavior. Accordingly, we propose the hypothesis ( $H_3$ ) below.

$H_3$ : Perceived behavior control has a significant positive effect on environmentally responsible intended behavior.

#### 2.5. Awareness of the consequences

The awareness of the consequences refers to the extent of an individual consciousness about the deleterious environmental impact caused by their behavior and actions (Han, 2020). In this context, this cognitive variable reflects how an individual sees or perceives the negative outcome and the result of their behavior and choice, awareness of the consequences associated with the ascription of responsibility. Many interdisciplinary research validated the significant and positive influence of awareness of the consequences and ascription of responsibility subjects, including consumption of green hotel and green restaurant products (Han, 2020), "word-of-mouth, buying, and sacrifice intentions for eco-cruises" (Han, Hwang, Lee, & Kim, 2019), and "environmental, behavioral intentions of university tourism students" (Pan, Chou, Morrison, Huang, & Lin, 2018). Moreover, the study focuses on environmentally responsible behavior. This link has been found among museum visitors (Han & Hyun, 2017a) and travelers in the USA (Han, 2014) vacationers on a cruise (Han, Yu, Koo, & Kim, 2019). Therefore, these prior findings have established a strong link between the two constructs, the awareness of the consequences is considered to be a good determinant of the ascription of responsibility. When an individual, in this context tourists, has a strong awareness of the problem caused by their behavior, they will develop a stronger feeling of responsibility to prevent the problem. Awareness is related to attitude; it has been referred to as attitude (Antimova, Nawijn, & Peeters, 2012). However, the research has found that awareness is a determinant of attitude. Sweldens, Corneille, and Yzerbyt (2014) outlined the importance of awareness in forming an attitude. A recent study in the hotel industry context had shared similar findings (Makanyeza, Sivotwa, & Jaiyeoba, 2021). The current studies have revealed that the more tourists are aware of the consequences, the more they attach reasonability to handling future problems and advocate a good attitude toward littering avoidance. Accordingly, we propose the hypothesis ( $H_4$ ) below.

$H_4$ : Awareness of the consequences significantly positively affects the ascription of responsibility.

#### 2.6. Ascription of responsibility

The variable ascription of responsibility is a personality factor that an individual may reflect and is stable in a particular event. However, it might be changeable across an individual. This construct is considered an essential variable in environmentally responsible behavior. There is a range of definitions proposed by several scholars. According to Stern (2000), an ascription of responsibility indicates an individual's feeling of responsibility for the negative impact and environmental consequences of their action and behavior. It is considered an essential factor in explaining intended behavior. It has also been documented as an important construct that activates personal norms (De Groot & Steg, 2008; Stern, 2000).



Several existing types of research in the diverse fields have reported the significant influence of the ascription of responsibility on personal norms. Yıldırım and Semiz (2019) employed the Value-Belief-Norm to determine the factors influencing environmentally responsible behavior (sustainable behavior, particularly water consumption), with 481 pre-service teachers in Turkey as participants. The findings revealed that the ascription of responsibility predicted personal norms. Besides, Han (2020) found that ascribed responsibility positively affected personal norms for green purchasing, particularly in green hotels and green restaurant products. Han (2014) used the Norm Activation Model to explain 340 tourists' intentions to attend an environmentally responsible conference. His study supported the positive association between responsibility and personal norms. Han and Hyun (2017b) later integrated the Theory of Planned Behavior and the Norm Activation Model to explain environmentally responsible behavior in the museum. A survey of 429 museum visitors found that attributed responsibility plays a crucial role in creating ecologically responsible behavior. The empirical result showed that increasing the ascription of responsibility could increase personal norms. Likewise, Han, Hwang, and Lee (2017) validated these findings in environmentally responsible convention travelers. In addition, the most recent study in the tourism context supported this evidence (Maminirina et al., 2022). Therefore, based on this evidence, this study believed that increasing the ascription of responsibility could increase the degree of the personal norm of tourists. Accordingly, we propose hypothesis ( $H_5$ ) below.

$H_5$ : Ascription of responsibility significantly positively affects personal norms.

## 2.7. Personal norm and the Theory of Planned Behavior construct (attitude, subjective norm, perceived behavior control)

Several prior studies examined norm-driven behavior to explain environmentally responsible behavior using various social-psychological theories (i.e., Denley et al., 2020; Lee & Jan, 2017; Luo, Tang, Jiang, & Su, 2020; Maminirina et al., 2022). Personal norms are identified as the strong predictor of intended behavior. Personal norm refers to the "individual conviction that acting in a certain way is right or wrong" (Bamberg et al., 2007). It refers to moral obligation (Han & Hyun, 2017b). Also, it is defined as the individual perception or feeling of being morally obligated to behave in a particular way or act confidently, whether right or wrong (Maminirina et al., 2022).

Prior studies found a positive relationship between personal norms and environmentally responsible behavior, such as conservation (Delaroché, 2020; Han, Kim, & Kiatkawsin, 2017), water consumption among pre-service teachers (Yıldırım & Semiz, 2019), and consumer pro-environmental behavior (Doran & Larsen, 2016; Rezvani, Jansson, & Bengtsson, 2017). In the context of tourism, this relationship between personal norms and environmentally responsible intended behavior has been confirmed in various contexts and settings, such as museum visitors (Han & Hyun, 2017b), travelers in the USA (Han, 2014), zero litter initiative in a national park in China (Hu et al., 2019), and environmentally responsible behavior of tourists at nature-based tourism in China (He, Hu, Swanson, Su, & Chen, 2018; Luo et al., 2020). In light of these results, it is clear that tourists and other vacationers would be more likely to engage in ecologically responsible conduct if they embrace a personal norm of doing so. Han and Hyun (2017b) integrated the Theory of Planned Behavior and the Norm Activation Model to explain the link between personal norms and intended environmentally responsible behavior in the museum. The structural equation model result shows the significant positive influence of personal norm environmentally responsible behavior intention. Likewise, Yıldırım and Semiz (2019) employed the Value-Belief-Norm to adopt sustainable behavior, particularly regarding the water consumption of 481 pre-service teachers in Turkey. The empirical evidence demonstrated that personal norms strongly influence intended behavior. However, studies in various contexts have established personal influence on intended behavior, including environmentally responsible, pro-environmentally, and green behavior, few have found different results indicating that, in some cases, the personal norm does not influence intention (Bamberg et al., 2007; Ghazali, Nguyen, Mutum, & Yap, 2019). This study assumes that this relationship may explain by different factors, including attitude, subjective norm, and perceived behavior control. Personal norms are unique and consistent features of persons that are not easily manipulable to modify behavior. However, its influence can be explained or intervened by different factors. Hence, it is critical to consider variables that potentially strengthen this desirable link.

This study suggests that if an individual has a robust personal norm related to a specific behavior. Individuals will also increase their positive attitude toward it, potentially increasing their intention to participate. Review literature on pro-environmental consumption, mainly organic food, concluded that personal norms and attitudes were interrelated (Aertsens, Verbeke, Mondelaers, & van Huylenbroeck, 2009). Although, it is widely argued that people act and participate in a particular way because of the social norm and pressure to increase their norms so that they act confidently. Our study claims that people obey social standards because they feel obligated to act, not because they fear others' opinions (Aertsens et al., 2009). That is to imply that people are more inclined to take into account the societal standard when they have a robust personal norm. This influence is significant and positive.

For example, Ghazali et al. (2019) tested the influence of personal norms on different types of pro-environmental behavior in Malaysia and China, and the findings confirmed this relationship in both groups. Likewise, Trautwein et al. (2021) illustrated that pro-environmental behavior in the context of Individual Muslim consumer norms on environmentally friendly had a salutary effect on prevailing societal norms. Furthermore, Tuhin et al. (2022) conceptualized that attitude mediates the relationship between personal norms and intention behavior in the consumer buying behavior context. Parker, Manstead, and Stradling (1995) argued that personal norm was a considerable aspect of attitude. It could manifest action and was relevant in shaping attitude, perceived behavior control, and subjective norm. As this research suggested, a more optimistic outlook may result from raising one's standards. Therefore, this study suggested that personal norms increase attitude, subjective norms, and perceived behavior control. In



Fig. 1. Map of Mount Merapi National Park.

addition, this study proposed that the Theory of Planned Behavior (attitude, subjective norm, perceived behavior) mediated the influence of personal norms on environmentally responsible intended behavior. Accordingly, we propose the hypotheses ( $H_6$ ,  $H_7$ ,  $H_8$ ) below.

- $H_6$ : Personal norms have a significant positive effect on subjective norms.
- $H_7$ : Personal norms have a significant positive effect on Attitude.
- $H_8$ : Personal norms have a significant positive effect on perceived behavior control.

### 3. Methodology

This research used a quantitative approach in this study. Data was collected in Mount Merapi National Park, Indonesia, using self-administered questionnaires (Fig. 1). The population of this study was park visitors in Indonesia, and the sample consisted of 328 park visitors. Participants were responsible for administering the questionnaire, and unfinished inquiries were ignored in the statistical computation and analysis. For example, 22 invalid data were eliminated in the data inspection due to missing information and incomplete questionnaires. 355 individuals were surveyed during their visit to the research site. A purposive sampling approach was used to engage the sample for this study. As a result, the valid data consist of 328 samples (93.7% response rate). The survey process and questionnaire development followed the guide of Podsakoff, MacKenzie, Lee, and Podsakoff (2003), including ensuring the anonymity and privacy of the respondent to reduce common social bias. Also, all the scales were randomized to reduce the potential effect of common method bias.

The survey questionnaires were initially designed in English and then translated into Indonesian. A back translation was carried out to guarantee that the translation would be accurate. A pilot test of the survey questionnaires was conducted with 30 university students to ensure the accuracy of the questionnaires. The questionnaires consist of three sections; general information about the objective of the survey and instructions, demographic information, and self-report attitudinal questions. Informed consent was obtained from all respondents with the questionnaire. The first section contains an introduction to the research topic and objective. Also, it provides a statement ensuring the confidentiality of the respondent's personal information. The data collection procedure followed an ethical approach (Husband, 2020; Sagarin, Ambler, & Lee, 2014). All items were carefully designed to



**Table 1**  
Demographic characteristics of the sample.

Demographics		n	%
Gender	Male	160	48.88
	Female	168	51.2
Age	18–25	205	62.5
	26–35	85	25.9
	36–45	27	8.2
	46–60	8	2.4
	60<	3	0.9
Education	High School	134	40.9
	Diploma	32	7.0
	Bachelor	111	33.8
	Master	54	16.5
	Ph.D.	6	1.8
Occupation	Student	160	48.8
	Private	51	15.5
	Government	43	13.1
	Self-employed	20	6.1
	Others	54	16.5
Total		328	100.0

Note: n = the numbers of participants in total sample; % = percentage of participants in total sample.

avoid ambiguous items to reduce common bias (Podsakoff et al., 2003). All the participants provided their informed consent to participate in this study.

All items and questions used in this study were adopted from prior studies on the related topic to provide reliable and accurate measures of the variables. Awareness of consequences constructed was measured by using three items adapted from Maminirina et al. (2022). The ascription of responsibility construct was measured by using three items adapted from Maminirina et al. (2022). Five items adapted from Maminirina et al. (2022) were used to assess the personal norm construct. Three adopted items from Fenitra, Tanti, Gancar, Indrianawati, and Hartini (2021) were used to test the attitude construct. Two items were adopted from Ojedokun et al. (2022) to measure the subjective norm construct. The perceived behavior control variable was evaluated using four items adapted from Fenitra, Tanti, et al. (2021) and Hu et al. (2019). Finally, the variable intended behavior was measured based on three items adopted from Ojedokun et al. (2022). Each item was measured using 5 Likert scales.

In this work, the data were analyzed with the help of software AMOS 23 and SPSS 23. Confirmatory factor analysis was employed to evaluate the reliability and validity of the measure and measurements. Discriminant validity was also conducted to assess the correlation between each variable and to ensure that each variable is not highly correlated. Further, structural equation modeling was used to test the hypothesis.

## 4. Result

### 4.1. Sample description

Table 1 described the demographic characteristics of the sample, the total sample in this study was 328 individuals visiting Mount Merapi National Park, Indonesia. 48.88% of the participants were male, and 52.2% were female. Most of the sample were aged between 18 and 25 years old (62.5%), followed by participants aged between 26 and 35 years old (25.9%). Of the 328 respondents, 134 respondents (40.9%) graduated from high school, 111 respondents (33.8%) earned bachelor degree, and 54 respondents (16.5%) have master degree. The majority of the respondents are students (48.8%). In general, the largest percentage of the respondents were female (51%) and students (48.8%), aged between 18 and 25 years old, and who had completed high school studies (40.9%).

### 4.2. Measurement evaluation

Confirmatory factor analysis and discriminant validity were conducted to evaluate the proposed model's measurements. The goodness-of-fit of the confirmatory factor analysis (CFA) indicated that the data and measurements were appropriate (Table 2). Confirmatory factor analysis was conducted to evaluate the convergent validity and reliability of the 25 items and seven variables. To assess the reliability of each variable, factor loading above 0.5 (Fenitra, Tanti, et al., 2021), average variance extracted cut off 0.5 (Fornell & Larcker, 1981; Henseler, Ringle, & Sarstedt, 2015; Henseler & Sarstedt, 2013), and composite reliability greater than 0.6 (Fenitra, Tanti, et al., 2021) was calculated. Table 2 demonstrated that all constructs had an average variance extracted above 0.5 and composite reliability above 0.6. The confirmatory factor analysis result indicated that each variable met the minimum criteria for reliability. Therefore, the variable adopted in this study meets the internal consistency and reliability.



**Table 2**  
Measurement items using confirmatory factor analysis.

Construct/Items	λ	AVE	CR
Attitude (ATT)		0.631	0.764
ATT <sub>1</sub> : "For me, reducing littering when traveling is very beneficial"	0.67		
ATT <sub>2</sub> : "For me, disposing of litter properly is very meaningful"	0.869		
ATT <sub>3</sub> : "For me, avoiding littering is very favorable"	0.830		
Environmentally responsible intended behavior (ERIB)		0.751	0.872
ERIB <sub>1</sub> : "I will make an effort to reduce littering in the near future"	0.835		
ERIB <sub>2</sub> : "I am willing to properly dispose of my litter"	0.866		
ERIB <sub>3</sub> : "I am willing to make an effort to take actions to prevent littering in a national park"	0.899		
Personal norm (PN)		0.517	0.735
PN <sub>1</sub> : "I feel I am obligated to do my part to reduce the impact of litter on the environment"	0.71		
PN <sub>2</sub> : "People like me should minimize the impact of litter on the environment"	0.718		
PN <sub>3</sub> : "As a tourist, I feel morally obligated to reduce litter to minimize my environmental impact"	0.79		
PN <sub>4</sub> : "I would feel guilty if I were not able to dispose of litter properly"	0.654		
PN <sub>5</sub> : "Preventing littering made me think of myself as an environmentally responsible tourist"	0.718		
Subjective norm (SN)		0.574	0.607
SN <sub>1</sub> : "Most people who are important to me engage in littering prevention actions in national parks"	0.741		
SN <sub>2</sub> : "If I do not take littering prevention actions, family members and friends who are important to me will disapprove"	0.774		
Ascription of responsibility (AR)		0.634	0.768
AR <sub>1</sub> : "I am responsible for the impacts of litter on the environment"	0.831		
AR <sub>2</sub> : "I am responsible for the impacts of litter on the environment"	0.868		
AR <sub>3</sub> : "I am responsible for minimizing the impacts of litter on the environment"	0.678		
Awareness of consequences (AW)		0.517	0.624
AW <sub>1</sub> : "Tourists' litter can generate huge negative environmental impacts in a national park"	0.738		
AW <sub>2</sub> : "Tourists can cause environmental deterioration of the destination due to littering"	0.751		
AW <sub>3</sub> : "Tourists can cause pollution, climate change, and exhaustion of natural resources because of a Litter of the tourists"	0.665		
Perceived behavior control (PBC)		0.531	0.707
PBC <sub>1</sub> : "I have enough physical strength to carry all my litter when I visit a national park"	0.694		
PBC <sub>2</sub> : "My tour route and time would be convenient to prevent littering when visiting national parks"	0.769		
PBC <sub>3</sub> : "I have bags for taking self-generated litter"	0.769		
PBC <sub>4</sub> : "For me, it is easy to do something helpful to protect the environment of the national park"	0.68		

Note: λ = factor loading, CR = composite reliability, AVE = average variance extracted.

#### 4.3. Discriminant validity

The correlation between variables was assessed to evaluate the discriminant validity. This process adopted an approach proposed by Fornell and Larcker (1981), which suggests that the correlation coefficient between each variable should not exceed the square root value of the average variance extracted. Table 3 demonstrated that the correlation coefficient between variables was smaller than the square root of the average variance extracted. Hence, all constructs meet the discriminant validity criteria.

#### 4.4. Structural model assessment

Structural equation modeling was used to validate the relationship between variables. Priorly, model goodness-of-fit was assessed to ensure the quality and power variance of the proposed framework. The result shows that the model fits goodness-of-fit index (GFI), Chi-square upon the degree of freedom gives ( $X^2/df$ ), root mean square error of approximation (RMSEA), Tucker–Lewis index (TLI), incremental fit index (IFI), and comparative fit index (CFI) (Table 4). All the values of goodness-of-fit indices meet the threshold value criteria of Chen (2007); Hu and Bentler (1999); Rosenthal and Ho (2020); Xia and Yang (2019).

**Table 3**  
Correlation between variables (discriminant validity).

Variable	1	2	3	4	5	6	7
Perceived behavior control	<b>0.729</b>						
Awareness of consequences	0.277	<b>0.719</b>					
Subjective norm	0.37	0.23	<b>0.758</b>				
Ascription of responsibility	0.102	0.366	0.084	<b>0.797</b>			
Attitude toward behavior	0.055	0.198	0.045	0.072	<b>0.794</b>		
Personal norm	0.403	0.323	0.515	0.453	0.425	<b>0.719</b>	
Environmentally responsible intended behavior	0.508	0.219	0.301	0.105	0.423	0.372	<b>0.867</b>

Note: Diagonal italic in boldface are square roots of average variance extracted, which must not exceed the correlation value between each variable.

**Table 4**  
Goodness-of-fit model results.

Measurements indices	Threshold value	CFA	Integrated model	TPB	NAM
$\chi^2/df$	<3	2.630	2.676	2.903	2.681
CFI	>0.9	0.955	0.954	0.975	0.960
GFI	>0.9	0.918	0.914	0.975	0.945
TLI	>0.9	0.942	0.943	0.963	0.951
IFI	>0.9	0.956	0.955	0.975	0.960
RMSEA	<0.08	0.066	0.067	0.064	0.060

Note:  $\chi^2/df$  = Chi-square/degree of freedom; CFA = confirmatory factor analysis; TPB = Theory of Planned Behavior; NAM = Norm Activation Model.

#### 4.5. Structural equation model results

The present study attempts to identify the factors forming environmentally responsible intended behavior and its determinants. The result of the structural model was presented in Table 5. The  $\beta$  value represented the relationship between endogenous and exogenous latent variables. The  $p$ -value significance should not exceed 0.001, 0.01, or 0.05 (Greenland et al., 2016).

$H_1$  examined the relationship between attitude toward preventing littering and environmentally responsible intended behavior. The structural model result ( $\beta = 0.620$ ;  $p < 0.001$ ) demonstrated that attitude toward preventing littering impacted environmentally responsible intended behavior. Hence,  $H_1$  was supported.  $H_2$  examines the relationship between subjective norms and environmentally responsible intended behavior. The structural model result ( $\beta = 0.027$ ;  $p = 0.798$ ) indicated that subjective norm did not significantly influence environmentally responsible intended behavior. Thus,  $H_2$  was not supported.  $H_3$  examined the relationship between perceived behavior control and environmentally responsible intended behavior. The structural model result ( $\beta = 0.303$ ;  $p < 0.05$ ) demonstrated that subjective norms influence environmentally responsible intended behavior. Hence,  $H_3$  was supported.  $H_4$  examined the relationship between awareness of consequences and the ascription of responsibility. The structural model result ( $\beta = 0.321$ ;  $p < 0.001$ ) indicated that awareness of consequences motivates the ascription of responsibility. Thus,  $H_4$  was supported. The structural equation explains that 60% of the variance of the ascription of responsibility was explained by awareness of consequences.  $H_5$  examined the relationship between ascription of the responsibility and personal norm. The structural model result ( $\beta = 0.419$ ;  $p < 0.001$ ) indicated that ascription of the responsibility positively impacts personal norm. Thus,  $H_5$  was supported at a  $p$ -value  $< 0.001$ . The empirical evidence shows that ascribing responsibility explained 35% of the variance of the personal norm.  $H_6$  examines the relationship between personal norms and attitudes toward littering prevention. The structural model results ( $\beta = 0.727$ ;  $p < 0.001$ ) demonstrated that personal norms have a significant favorable influence on attitude. Hence,  $H_6$  was supported.  $H_7$  examined the relationship between personal norms and subjective norms. The structural model results of  $H_7$  demonstrated that personal norms significantly positively influence subjective norms ( $\beta = 0.768$ ;  $p < 0.001$ ). Hence,  $H_7$  was supported.  $H_8$  examined the relationship between personal norms and perceived behavior control. The structural model results demonstrated that personal norms significantly influence perceived behavior control, e.g., ( $\beta = 0.950$ ;  $p < 0.001$ ). Hence,  $H_8$  was supported. The structural equation explained that attitude, subjective norm, and perceived behavior control explained 41% of environmentally responsible intended behavior variance.

#### 4.6. The mediating test of attitude, subjective norm, and perceived behavior control

This study tested the bootstrap method's indirect, direct, and total effects. This method is compatible and widely used to test the indirect effects and multiple mediators (Byrne, 2016; MacKinnon, Lockwood, & Williams, 2004). This study followed the suggestion of Preacher and Hayes (2008) to use 2000 bootstrap samples and a 95% confidence level confidence interval. This method

**Table 5**  
Results of structural equation model.

Hypothesis	Path	$\beta$	SE	$p$	Result
$H_1$	ATT → ERIB	0.620	0.104	***	Supported
$H_2$	SN → ERIB	0.027	0.104	0.798	Not supported
$H_3$	PBC → ERIB	0.303	0.128	*	Supported
$H_4$	AC → AR	0.321	0.064	***	Supported
$H_5$	AR → PN	0.419	0.042	***	Supported
$H_6$	PN → ATT	0.727	0.061	***	Supported
$H_7$	PN → SN	0.768	0.086	***	Supported
$H_8$	PN → PBC	0.950	0.075	***	Supported

Note: \*\*\*  $p < 0.001$ ; \*  $p < 0.05$ ;  $R^2$  (ascription of responsibility) = 0.60;  $R^2$  (personal norm) = 0.35;  $R^2$  (attitude) = 0.49;  $R^2$  (perceived behavior control) 0.66;  $R^2$  (subjective norm) = 0.50;  $R^2$  (environmentally responsible intended behavior) = 0.41;  $\beta$  = coefficient; SE = standard error;  $t$  =  $t$ -value;  $p$  =  $p$ -value; AW = awareness of consequences; AR = ascription of responsibility; PN = personal norm; ATT = attitude toward behavior; SN = subjective norm; PBC = perceived behavior control; ERIB = environmentally responsible behavior intention.



**Table 6**  
Results of structural model (mediation effect).

Path	Effect	$\beta$	SE	Confidence interval		p
				Lower	Upper	
PN→ATT→ERIB	Total	0.783	0.097	0.647	0.974	***
	Indirect	0.451	0.099	0.314	0.657	**
	Direct	0.332	0.126	0.131	0.543	**
PN→SN→ERIB	Total	0.775	0.097	0.642	0.968	***
	Indirect	0.134	0.57	0.049	0.234	**
	Direct	0.573	0.140	0.362	0.821	**
PN→PBC→ERIB	Total	0.779	0.088	0.658	0.919	**
	Indirect	0.423	0.101	0.275	0.625	*
	Direct	0.356	0.124	0.163	0.567	*

Note: \*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$ ;  $\beta$  = coefficient; SE = standard error; PN = personal norm; ATT = attitude toward behavior; SN = subjective norm; PBC = perceived behavior control; ERIB = environmentally responsible intended behavior.

measured the multiple mediating roles of attitude, subjective norm, and perceived behavior control. According to Preacher and Hayes (2008), if the interval of the effects is contained, then the impacts do not exist, and vice versa.

Table 6 showed the paths, unstandardized path coefficients ( $\beta$ ) with the bootstrap standard error (SE), lower and upper confidence intervals of the bootstrapping,  $p$ -value, and the model summary. The statistical findings indicate that the bias-corrected percentile refers to the confidence interval of indirect effects for personal norms and environmentally responsible intended behavior through attitude (0.314–0.657), subjective norms (0.049–0.234), and perceived behavior control (0.275–0.625). This confidence interval did include 0 in its range. Therefore, it is indicated that there is a mediating effect of attitude, subjective norm, and perceived behavior control. Also, the total effect of each path was statistically significant. Therefore, none of the confidence intervals include zero. Besides, the interval confidence of direct effect for personal norm and environmentally responsible intended behavior through attitude (0.131–0.543), subjective norms (0.362–0.821), and perceived behavior control (0.163–0.567) did not include 0. Thus, the results suggest that attitude, subjective norm, and perceived behavior control partially mediate the relationship between personal norm and environmentally responsible intended behavior.

## 5. Discussion

This study aims to illuminate the mental processes that motivate planned actions toward park visitors in Indonesia. It examines eco-friendly intentions through the lens of the Theory of Planned Behavior and the Norm Activation Model. Destinations can take on these issues through a behavioral change strategy if they understand visitor behavior and the variables impacting their prevention of littering.

$H_1$ , this study confirms the positive influence of attitude toward behavior on littering prevention intention. Prior findings suggest that park visitors who have a strong positive attitude toward behavior show a stronger intention to engage in littering prevention (Hu et al., 2019; Ojedokun et al., 2022; Onel & Mukherjee, 2017; Panwanitdumrong & Chen, 2021; Poudel & Nyaupane, 2017; Safshekan et al., 2020). The result explains that when a tourist destination such as a national park stimulates the park visitors' primary belief toward the behavior. It will establish a more substantial positive attitude toward behavior, leading to a stronger intention to participate in littering prevention. According to research, human values aggregate an individual's social, psychological, cultural, emotional, and religious capital (Abbas, Ekowati, Suhairidi & Anwar, 2022). The results of this study lend further credence to the idea that environmental factors significantly influence individual personalities. In continuation with this line of thinking, literature also proposed that three elements can influence how a person views their surrounding environment: (a) access to material and immaterial goods that meet basic human needs; (b) opportunities to engage in healthy, socially beneficial, environmentally protective behaviors; and (c) the presence of environmental problems that must be addressed and resolved (Corral-Verdugo, Corral-Frías, Frías-Armenta, Lucas, & Peña-Torres, 2021). Therefore, one's social environment, sense of responsibility, and observance of social standards would substantially influence one's capacity to formulate plans congruent with those norms.

$H_2$ , our results do not support the findings of the past studies (Liu et al., 2019; Onel & Mukherjee, 2017; Panwanitdumrong & Chen, 2021; Sia & Jose, 2019). These studies found that friends, family, and peer influences played a crucial role in one's behavior and decision. In contrast, this empirical research has found that the subjective norm does not favor environmentally responsible intended behavior. Based on the survey of 328 park visitors, subjective norms do not consider social pressure from friends and family to be crucial for motivating them to participate in littering prevention. This hypothesis is a very accurate description consistent with the direction of scientific literature, which suggests that people's social habits are heavily influenced by their immediate requirements.

In comparison, people are susceptible to their peers' persuasive power. The unpredictability of human conduct stems from the fact that people are stubbornly committed to prosocial or antisocial behavior, depending on their perceived well-being state of mind (Abbas, Ekowati, Suhairidi, & Hamid, 2022; Li et al., 2021). Usually, invisible values may surface in contexts where they are most appropriate, which in any particular circumstance may vary from social and familial considerations.

$H_3$  has perceived behavior control influences environmentally responsible intended behavior. The findings consistent with prior findings have indicated that perceived behavior control drives environmentally responsible intended behavior (Hu et al., 2019; Ojedokun et al., 2022; Poudel & Nyaupane, 2017). The result suggests that when the visitor perceives that they control their behavior toward littering prevention. Individuals' willingness to participate in pro-social behavior, e.g., littering prevention in National parks, would be increased. Similar findings have been reported in different contexts, such as reducing marine litter (Panwanitdumrong & Chen, 2021) and zero litter initiatives (Hu et al., 2019). The results of this study show that individuals are ultimately free to act, following whatever values and philosophies best serve their happiness and sense of security. Individuals will choose to do actions consistent with their beliefs if they are the ultimate arbiters of their actions (Abbas, Ekowati, Suhariadi, & Hamid, 2022). The positive and adverse aspects of behaviorism reflect one another in the freedom and resolve that can be studied in the context of perceived behavioral control. Given the importance of  $H_3$ , we can build our argument around the idea that individuals can exert some degree of influence over their responsible behavior. It is possible for people to feel secure in their bond, plan and act accordingly, even if they have little or no say over their companion's actions and behaviors.

Responsibility assignment is inspired mainly by awareness of the consequences, according to  $H_4$ . The relationship is positive. This argument is in line with previous studies stating that the level of awareness of an individual about the environmental problem increases their ascription of responsibility. The findings support the prior study (Han, 2020; Han, Hwang, et al., 2019; Han & Hyun, 2017b; Han, Yu, et al., 2019). When tourists or park visitors are aware of their impact on the environment, they feel responsible for mitigating it. That is to say, when visitors to a park or other tourist attraction realize that littering might inflict serious difficulties, they feel compelled to take action to prevent it. Communication, perception, an ascription of responsibility play, and tool usage all contribute to the development of human awareness. Our level of awareness shapes human consciousness; for example, consciousness is not a brain process but rather a kind of behavior under the brain's control (Kotchoubey, 2018). Thus, policymakers and destination managers should provide positive and suitable information according to the situation and individual needs. They can strategize to launch awareness campaigns or guide littering prevention to enhance visitors' awareness because it forms attitudes and intentions toward conduct (Cheng & Lu, 2013).

The  $H_5$  considers the potential benefits of assigning blame and upholding one's standards. The findings are consistent with the prior results (Han, 2014; Han, Hwang, & Lee, 2017; Han & Hyun, 2017b; Han, Lee, & Hwang, 2016; Maminirina et al., 2022; Yıldırım & Semiz, 2019). Ascription of responsibility measures how much an individual feels they should prevent or decrease the harm caused by their activity or behavior. This empirical evidence reveals that increasing that sense or feeling of being responsible for taking any action can increase personal norms, also called moral obligation. This construct is considered an essential factor that formalizes environmentally responsible intended behavior, particularly in preventing littering. This sense of societal obligation manifests in responsible behavior when people act on it. As a result, the environment has shaped people's behaviors on this planet. This ethical action proves that people are willing to adapt to new societal standards in critical situations. However, it necessitates widespread education and training to effect real change (Abbas, Ekowati, Suhariadi, Fenitra, & Fahlevi, 2022; Fenitra, Abbas, Ekowati, & Suhairidi, 2022).

$H_6$  tests the relationship between personal and subjective norms; this relationship was positive and significant. This finding explains that when an individual has a more substantial feeling about their obligation to participate and act in a particular way, such as preventing littering. The stronger the personal norm of the park visitors toward preventing littering, the stronger their favorable attitude toward this behavior. This finding is consistent with Tuhin et al. (2022). The theory that people have a profound responsibility to take part in and act in a certain way to achieve environmental progress is consistent with this hypothesis. Making individuals feel that they have a moral need to pitch in to maintain a clean environment would take some deftness of mind. Strategic forethought and the ability to influence behavior from any positive means would be the ultimate requirement (Fenitra et al., 2022).

$H_7$  examines the influence of personal norms on subjective norms. The results support prior findings arguing that personal norms are essential in strengthening subjective norms (see Ghazali et al., 2019; Trautwein et al., 2021). Though past studies argued that subjective norm predicts personal norm, that is not always the case in other types of behavior. This study suggests that when individuals have a stronger sense of moral obligation to evolve in a particular way, they will cope with and consider the social norm. Thus, it is concluded that the higher the personal norm of the tourists visiting the national park, the higher their consideration of social norms. It will be aligned with the goals of pro-environmental conduct after people have made up their minds. When individuals realize that they can make an impact positively, they will no longer be indifferent to the environments in which they are immersed (Fenitra et al., 2022).

$H_8$  tests the positive influence of personal norms on perceived behavior control. The findings explain that individuals with a robust personal norm about the environment would perceive that they might have control when dealing with littering prevention. It occurs because the personal norm is a more intrinsic belief that can deliberate and manifest action. This factor can also increase one's perception of control over their behavior. If individuals feel obligated to do so, they will find a way to accomplish their tasks and think they can do so. When people become aware that they can have a good effect on the circumstances in which they are engaged, they will no longer be apathetic to those settings (Fenitra et al., 2022). It will be adjusted to align with the objectives of environmentally responsible behavior. The prevention of environmentally irresponsible behavior, such as littering, is one of the essential components of developing sustainable tourist attractions. In order to achieve sustainable development, it is necessary to lessen the detrimental effects tourism activities have on the economy and society. Finally, this study has revealed that the constructs of the Theory of Planned Behavior mediate the relationship between personal norms and environmentally responsible intended behavior. Personal norms, directly and indirectly, affect this particular behavior, attitude, subjective norm, and perceived behavior control strengthen the relationship.



## 6. Conclusion

Promoting environmentally responsible behavior, such as littering prevention, is critical in developing sustainable tourism destinations. Nevertheless, reducing the negative impact of tourism activities on economics and society is essential for sustainable development (Fenitra et al., 2022). Therefore, protecting natural resources and the environment from human-caused deterioration, including littering, is vital. This concludes that attitude and perceived behavior control forms specific environmentally responsible intended behavior such as littering prevention. Moreover, when park visitors are educated on the importance of keeping their parks litter-free, they have a more positive outlook on the practice. Despite several prior studies' efforts to imply the Theory of Planned Behavior and Norm Activation Model, the implication and integration of these theories were successful. The present study attempts to understand how these two theories interact and investigate the moderating role of attitude. Subjective norms, perceived behavior control, in the relationship between personal norms and intended behavior are integrated into this study accordingly. Scholars also have established the significant influence of each construct (attitude, subjective norm, perceived behavior control) on intended behavior. However, this study reveals that the subjective norm does not contribute to the formation of intended behavior toward littering prevention in the context of National Park visitors in Indonesia.

Furthermore, this study emphasizes personal norms and environmentally responsible intended conduct. This relationship is moderated by the Theory of Planned Behavior concepts, specifically subjective norm and perceived behavior control. The results emphasized that these constructs partially mediated the influence of personal norms on intended behavior.

This work expands the existing knowledge on the Theory of Planned Behavior and the Norm Activation Model. It gives insight into how these two theories interact and builds to explain an essential issue in tourism in Indonesia, focusing on particular environmentally responsible behavior. Attitude, perceived behavior control, personal norm, awareness, and responsibility contribute significantly to the formation of littering prevention intention. Tourism destinations should stimulate the attitude of tourists to protect the destination by increasing their awareness of the consequences of littering. Clear information about the environmental problem and the negative impact of irresponsible behavior needs to be provided. Destinations also can provide an environmental conservation program oriented. An organized trip and a trained tour guide are essential in this case.

Moreover, policy and regulation should focus on improving littering prevention as it might lead individuals to engage in this behavior. The objective is to ensure that the positive attitude of tourists toward this behavior is increased. Therefore, it is essential to consider how to increase tourists' confidence in their capacity to refrain from littering, which can be aided by offering convenient amenities like trash cans. Besides, information and guides for proper litter also should be made clear, so it helps tourists to take control of their actions.

Few limitations are acknowledged, which provide directions for future research. First, this study's results cannot be considered as generalizable because of its sample size, the limitations of the theoretical framework, and the survey questionnaire covered. For example, this study only focuses on specific environmentally responsible behavior, particularly preventing littering by tourists visiting national parks. Second, the present model shows that future studies can incorporate an additional variable (i.e., incentives and availability of trash bins) to improve the exploratory power variance of intended behavior. Besides, this study only focuses on examining intended behavior and overlooks its outcome. Thus, extending the model by explaining the influence of intended behavior on actual behavior is essential. Third, future studies should broaden the focus on the different types of environmentally responsible behavior and expand to different contexts and settings. The respondents of this study are park visitors at Mount Merapi National Park, Indonesia. Thus, the result cannot be generalized. This study urges this model to be expanded and implied in a different geographical area. Besides, expanding the research method would provide an exciting and profound result through a qualitative approach. Since this study used cross-sectional data solely to show a relationship between the variable and prediction, gaining insight into the causation experiment is recommended for future study.

Furthermore, this study was conducted to explain the phenomenon in Indonesia. Therefore, future research is encouraged to adopt and test this model across different countries and compare the behavior across countries. In addition, to measure personal norms, future research should explicitly conceptualize the two types of personal norms, introjected and integrated norms, to gain a more comprehensive understanding (Thøgersen, 2006).

### Ethics statement

Ethics approval was obtained from the Ethics Committee of Airlangga University. In addition, the participants provided their informed consent to participate in this study.

### CRedit authorship contribution statement

**Rakotoarisoa Maminirina Fenitra:** Conceptualization, Methodology, Visualization, Writing - original draft, Writing - review & editing. **Nisful Laila:** Resources, Supervision, Writing - review & editing. **Gancar Candra Premananto:** Supervision, Writing - review & editing, Visualization, Validation. **Ansar Abbas:** Investigation, Formal analysis, Data curation, Writing - review & editing, Visualization. **Rakotoarisoa Maminirina Heritiana Sedera:** Investigation, Formal analysis, Data curation.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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