

MOTIVATION TO PANGOLIN CONSERVATION AMONG GEN Z: APPLYING THE EXTENDED THEORY OF PLANNED BEHAVIOR

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Highlights:

- all classical and extended TPB factors significantly shape Gen Z's pangolin conservation intentions in Vietnam, with subjective norms and perceived behavioral control being the strongest influences;
- while attitudes, knowledge, and past experiences have a positive impact, their influence is weaker than that of subjective norms and perceived behavioral control;
- subjective norms and perceived behavioral control are key drivers of Gen Z's pangolin conservation intentions in Vietnam;
- the results contrast with previous studies that found subjective norms had the weakest influence on behavioural intentions.

Article History:

- received 28 February 2025
- accepted 14 July 2025

Abstract. The study explores the factors influencing pangolin conservation intentions among Gen Z using the extended Theory of Planned Behavior (TPB). Despite ongoing conservation efforts, pangolins remain one of the most trafficked animals globally, facing severe threats from illegal wildlife trade. To address this, the research investigates the roles of attitudes, subjective norms, and perceived behavioral control, along with knowledge and experience, in shaping conservation behaviors. A quantitative approach was employed, utilizing a structured questionnaire to gather data from 377 respondents. Partial Least Squares Structural Equation Modeling (PLS-SEM) was applied for data analysis.

The results show that subjective norms and perceived behavioral control are the most significant predictors of behavioral intentions, whereas attitudes, knowledge, and past experiences related to wildlife conservation or pangolins have a relatively weak influence. While they still have a positive effect, these factors do not influence the intention to engage in pangolin conservation behavior as strongly. These findings suggest that conservation campaigns should focus on leveraging social influences and enhancing individuals' perceived control over their actions rather than solely increasing factual knowledge.

Keywords: pangolin, wildlife conservation, Gen Z, the extended of Theory of Planned Behavior, behavioral intentions.

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1. Introduction

Pangolins are the only mammals in the world covered in scales. There are eight pangolin species: four in Asia and four in Africa. Pangolins are among the most trafficked mammals in the world, largely driven by demand for their consumption and use in traditional medicine (Alves & Rosa, 2005). With approximately 895,000 individuals illegally traded between 2000 and 2019 (Challender et al., 2014), pangolins are a critical conservation concern globally (Heighton & Gaubert, 2021).

Both the Sunda (*Manis javanica*) and Chinese pangolins (*Manis pentadactyla*), which are categorized as critically endangered on the International Union for Conservation of Nature's (2019) Red List, are found in Vietnam (Donnelly, 2024). They are in danger of going extinct. The two indigenous species are prohibited from international commercial

trade by the Convention on International Trade in Endangered Species (CITES) and are completely protected under Vietnam's wildlife protection legislation (Clark et al., 2009). Hunting, trapping, keeping, killing, transporting, selling, or promoting pangolins or pangolin-related goods is prohibited in Vietnam. Various stakeholders, including governmental and non-governmental organizations have actively and jointly engaged in pangolin conservation (Gray et al., 2022). Specifically, the Vietnamese government approved the emergency action plan for pangolin species conservation calls for spending about VND 85 billion on pangolin conservation in 2020–2030 (Nguyen, 2023). International and local non-governmental organizations, like The World Sustainability Foundation (WSF) and Save Vietnam's Wildlife (SVW), continue their commitment to the preservation of pangolins through multi-action, including rescuing, rehabilitating, and protecting pangolins and their natural

habitat (Donnelly, 2024; Shibaike, 2022). Since 2015, these organizations have run mass media campaigns to raise public awareness on pangolin conservation in the long term. Incorporating pangolin conservation into school curricula and fostering ecological knowledge are key to fostering sustainable conservation behaviors. Additionally, many study tours are organized, through which participants have a unique experience as actual centre keepers to provide direct care for the pangolins while learning about the difficulties they encounter.

Despite these efforts, a critical gap remains in understanding the behavioral intentions of individuals toward pangolin conservation (Donnelly, 2024). Existing research has primarily focused on broader wildlife conservation issues or other species, with limited attention given to pangolins specifically (Lo et al., 2012). Furthermore, research has predominantly examined general public attitudes, neglecting demographic nuances, particularly the conservation behaviors of younger generations (Zhang et al., 2022).

This study seeks to bridge this gap by examining the behavioral intentions of Gen Z (individuals born between 1997 and 2012) toward pangolin conservation. It aims to identify the factors influencing conservation intentions, with a focus on how their digital habits can be leveraged to enhance wildlife conservation efforts. While the TPB has been widely applied to understanding wildlife-related behaviors, its application to pangolin conservation remains underexplored (Ajzen, 1980, 2020; Miller, 2017). By expanding the TPB to include knowledge and experience, this study provides a more comprehensive framework for understanding the behavioral drivers of conservation in younger populations, contributing valuable insights into how to effectively engage this demographic in pangolin conservation efforts.

2. Literature review and hypothesis development

The TPB was proposed by Ajzen (1980), based on the Theory of Reasoned Action (TRA). According to the classical TPB framework, behavioral intention is the most direct factor affecting behavior, which is influenced by attitudes, subjective norms, and perceived behavioral control. As a result, the stronger the intentions to engage in a behavior, the more likely that behavior is. A key addition to TPB is the concept of perceived behavioral control, which refers to an individual's perception of the ease or difficulty of performing a particular behavior. Together, this factor, along with attitudes and subjective norms, determines behavioral intentions, which in turn influence actual behavior.

Previous studies show that TPB has been widely used in behavioral research and successfully applied in numerous fields, including wildlife conservation practices (Miller, 2017). Many researchers have used TPB to successfully understand conservation behaviors with a high explanatory power (Kaiser & Gutscher, 2003). In the context of wildlife conservation movements, attitudes, beliefs, and norms

are crucial in changing behavior (Stern, 2000). Although research specifically on public participation in pangolin conservation is limited, several studies have examined individual behavioral intentions to engage in the conservation of other species. These studies have utilized the classical TPB framework to identify key influencing factors. For example, a study on Chinese college students' intentions to support the conservation of Asian turtles (*Heosemys grandis*) found that their behavioral intentions were primarily influenced by subjective norms, attitudes toward turtle protection, and perceived behavioral control (Lo et al., 2012). Similarly, research on boaters' conservation intentions regarding manatees (*Trichechus manatus latirostris*) revealed that knowledge, attitudes, and subjective norms played a significant role in shaping their support for conserving manatees (Aipanjiguly et al., 2003). Beyond psychological variables, the classical TPB framework has been enhanced by incorporating non-psychological factors, such as experience, age, and various demographic characteristics, to further develop the model (Pasquariello et al., 2025). For instance, in China, the overall intention to protect elephants was low, but individuals with higher levels of education and better economic status were more likely to have a stronger intention to protect the species (Zhang et al., 2022). Moreover, strong ethical values and socio-economic factors had statistically significant effects on the variation in behavioral intentions to support the conservation of the Asian turtle (*Heosemys grandis*) in China (Lo et al., 2012). These findings suggest that while the classical TPB remains a valuable framework for predicting conservation behavior, incorporating additional socio-economic and ethical dimensions can provide a more comprehensive understanding of conservation intentions.

2.1. Attitude toward pangolins and the pangolin conservation (ATP)

Attitude refers to an individual's overall perception of a particular behavior, whether positive or negative (Ajzen, 1991). It is shaped by behavioral beliefs and the evaluation of potential outcomes (Asare, 2015). Research has consistently shown that attitudes toward conservation play a crucial role in predicting behavioral intentions to protect wildlife. For example, individuals' willingness to engage in conservation efforts has been strongly linked to their attitudes toward species such as manatees (Aipanjiguly et al., 2003) and Asian turtles (Lo et al., 2012). Those who hold positive attitudes toward wildlife are generally more supportive of conservation initiatives aimed at sustaining and increasing animal populations (Greenspan et al., 2020). Moreover, studies have highlighted that attitudes toward a specific species serve as a significant predictor of people's willingness to participate in conservation activities for that species (Siemer et al., 2021). In this study, the public's attitude toward pangolin conservation intentions was assessed from four perspectives: personal feelings about the behavior, self-assessment of the behavior's value, the social importance of the behavior, and the sense of per-

sonal fulfilment when engaging in the behavior. This study examines two types of attitudes: one towards pangolins and the other towards the behavior of pangolin conservation. Typically, it's assumed that more positive attitudes lead to stronger behavioral intentions. Based on this, one hypothesis related to attitudes is proposed as follows:

H1: *Attitude toward pangolins and its conservation (ATP) positively affects the intentions to conserve pangolins.*

2.2. Subjective norms (SN)

Subjective norms, the second key component of TPB, refer to an individual's perception of social pressure to either engage in or refrain from a particular behavior (Ajzen, 1991). These norms develop from a combination of normative beliefs – what individuals think others expect of them – and their motivation to conform to those expectations (Johnson, 2015). Cialdini et al. (1991) classified subjective norms into three categories: personal norms, descriptive norms, and imperative norms. Among these, personal norms are closely linked to self-identity and moral principles. Expanding on this idea, Harrison (1995) found that incorporating ethical considerations into behavioral research significantly strengthened the theory's ability to explain human actions.

Building on these insights, this study incorporates personal ethics within the broader framework of norms, alongside subjective norms. In this context, personal ethics are defined as an individual's sense of duty or responsibility in contributing to pangolin conservation efforts. Meanwhile, subjective norms include both imperative and descriptive norms. Imperative norms represent the perceived social pressure to participate in pangolin conservation, whereas descriptive norms relate to an individual's perception of how others are engaging in conservation efforts (Zhang et al., 2022).

Subjective norms play a crucial role in shaping behavioral intentions in various wildlife conservation activities, such as volunteering and donating (Dybsand & Stensland, 2022). However, despite their theoretical significance, research has often found that subjective norms have the weakest influence on behavioral intentions (Yan, 2014). That said, the perceived social pressure to engage in wildlife conservation can stem not only from close social circles, such as family and friends (Lo et al., 2012), but also from broader societal influences, including government policies and cultural expectations (Zhang et al., 2022). While previous studies have found subjective norms to have a weak impact on behavioral intentions, their role in pangolin conservation remains underexplored. Given the cultural and social influences on conservation behaviors, subjective norms may still play a significant role. In this study, subjective norms are conceptualized through personal ethics, imperative norms, and descriptive norms. Personal ethics reflect an individual's moral responsibility for pangolin conservation, imperative norms refer to perceived social pressure, and descriptive norms capture perceptions of others' participation. As research suggests

that stronger social pressure enhances behavioral intentions, subjective norms may influence conservation efforts despite prior findings of weak effects. Thus, the following hypothesis is proposed:

H2: *Subjective norms (SN) positively affect the intentions to conserve pangolins.*

2.3. Perceived behavioral control (PBC)

The third factor that influences intentions is perceived behavioral control, which refers to an individual's assessment of how easy or difficult it is to engage in a particular behavior. This assessment is influenced by both previous experiences and the anticipated obstacles (Ajzen, 1991). In the TPB, perceived behavioral control is essential because it impacts an individual's belief in their capability to perform the behavior. Furthermore, the availability of resources and opportunities is a key determinant in the likelihood of successfully carrying out the behavior (Ajzen, 1991).

Multiple studies have shown that perceived behavioral control has a direct positive influence on intentions to participate in wildlife conservation activities (Lo et al., 2012). For example, Lo et al. (2012) found that individuals with a higher sense of control were more likely to engage in turtle conservation efforts, while Dybsand and Stensland (2022) observed a similar effect in wildlife volunteering and donation behaviors. These findings indicate that when people perceive fewer obstacles, they are more inclined to take part in conservation initiatives. In this study, perceived behavioral control pertains to individuals' perception of how challenging participation in pangolin conservation is. Typically, the less difficult they perceive it to be, the stronger their intentions to engage in conservation efforts. Accordingly, the following hypothesis is proposed:

H3: *Perceived behavioral control (PBC) positively affects the intentions to conserve pangolins.*

Given the well-documented limitations of the TPB, particularly its exclusive focus on rational reasoning and neglect of unconscious and emotional influences (Sommer, 2011), expanding the theory to include predictors such as experience and knowledge (see Figure 1) is a necessary evolution. By drawing on the classical TPB framework alongside recent studies that advocate for an extended approach (Lo et al., 2012), this study aims to provide a more comprehensive understanding of both psychological and non-psychological factors influencing the behavioral intentions to conserve pangolin. This expansion aligns with Ajzen (2020) who stated that additional predictors can enhance the explanatory power of the TPB.

2.4. Knowledge of pangolins (KN)

Pro-environmental behavior is largely driven by a deeper scientific understanding of environmental issues (Aipan-jiguly et al., 2003). Research in wildlife conservation has consistently highlighted knowledge as a crucial factor in-

fluencing individuals' intentions to protect species (Aipan-jiguly et al., 2003). In this study, knowledge is defined as an individual's awareness of factual information about pangolins. The more knowledgeable people are, the more likely they are to recognize the importance of conservation and develop stronger intentions to participate in conservation activities (Zhang et al., 2022). Previous studies have demonstrated a positive relationship between biodiversity knowledge and willingness to pay for conservation efforts (Bhandari & Heshmati, 2010). Additionally, research has shown that students with greater knowledge of wildlife tend to have more favorable attitudes toward conservation (Schlegel & Rupf, 2010). Consistent with these findings, a higher level of knowledge about pangolins is expected to increase individuals' intentions to support their conservation, reinforcing the idea that knowledge plays a significant role in shaping conservation behavior. Based on this reasoning, the following hypothesis is advanced:

H4: Knowledge of pangolins (KN) positively affects the intentions to conserve pangolins.

2.5. Experience in pangolin conservation (EX)

Past behavior frequency has been shown to influence future behavior, even independently of intentions (Ajzen, 2020). Studies have shown that previous experience directly influences behavioral intentions and can account for about 7.2% of their variance (Conner & Armitage, 1998). In the context of wildlife conservation, past behavior has been identified as a key predictor of individuals' intentions to adopt light-glow reduction practices for marine turtle conservation (Kamrowski et al., 2014). Similarly, experience in conservation efforts was found to positively influence Chinese residents' willingness to protect African elephants (Zhang et al., 2021). In this study, experience refers specifically to individuals' past participation in wildlife conservation activities, particularly those related to pangolins. Based on previous findings, this study incorporates experi-

ence into its theoretical framework, emphasising that prior involvement in conservation efforts can play a significant role in shaping individuals' future engagement in pangolin conservation. Given this context, the following hypothesis is formulated:

H5: Experience in pangolin conservation (EX) positively affects the intentions to conserve pangolins.

2.6. Behavioral intentions (BI)

The fourth component of TPB is behavioral intentions, which represent the motivational factors that drive behavior (Ajzen, 2020). The more determined an individual is to carry out a specific behavior, the higher the likelihood they will actually engage in it (Asare, 2015). Intentions are seen as indicators of the effort individuals are willing to invest and how determined they are to carry out the behavior.

Behavioral intentions are shaped by the combined influence of attitude, subjective norms, and perceived behavioral control, which ultimately determine whether a person chooses to engage in the behavior or not (Imari et al., 2020). For instance, Popa et al. (2019) utilised the TPB to examine intentions related to forest law enforcement in Romania. Their study revealed that attitude, subjective norms, and perceived behavioral control were key factors influencing individuals' willingness to engage in enforcement activities. Building on this framework, this study predicts that attitude, subjective norms, and perceived behavioral control influence behavioral intentions, specifically the intentions to conserve pangolin. Consequently, one hypothesis related to behavioral intentions is suggested:

H6: Behavioral intentions (BI) positively affect behavior of pangolin conservation (BE)

Figure 1 illustrates the theoretical framework in the current study.

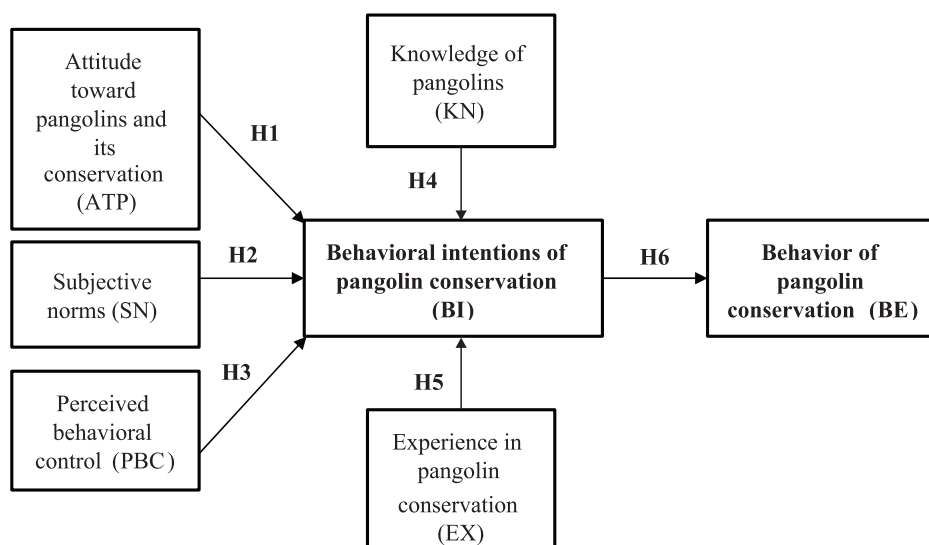


Figure 1. Theoretical framework for analysis and hypotheses (source: by authors)

3. Methods

3.1. Research design and measurement

This research used a quantitative methodology. The questionnaire was designed to capture data relevant to the TPB constructs, focusing on the factors influencing conservation intentions among Gen Z in Vietnam. This method was selected due to its versatility and effectiveness in gathering structured responses across diverse research contexts (Kuphanga, 2024). The objective of the study was clearly outlined, and participants were informed and asked for their consent, with assurances regarding the confidentiality of their responses provided in the initial phase. Additionally, since the focus of the research is on human behavior management rather than human-animal interactions, ethical approval was not deemed necessary.

The questionnaire was divided into two main sections. The first section collected essential demographic information, including generation of participants, gender, occupation, residence, and income, ensuring that participants fit the study's inclusion criteria. Table 1 summarizes the demographic characteristics of the sample. The second section of the questionnaire measured key TPB constructs, namely attitude toward pangolins and its conservation (ATP), subjective norms (SN), perceived behavioral control (PBC), knowledge of pangolin (KN), experience in pangolin conservation (EX), behavioral intentions (BI), and behavior of pangolin conservation (BE) (see Appendix – Measurement items). These factors were selected based on the previous works (Zhang et al., 2022), ensuring their relevance and applicability to the current study. A seven-point Likert scale was used for respondents to rate each item, with 1 indicating "strongly disagree" and 7 indicating "strongly agree". The methodology ensured robust data collection, minimizing knowledge biases while offering meaningful information about the factors influencing behavior related to pangolin conservation.

3.2. Data collection

The target population includes Gen Z in Ho Chi Minh City who are aware of or involved in pangolin conservation efforts. They may be students, office workers, and freelancers. Targeting Gen Z is crucial for several reasons. Firstly, this generation is digital natives with significant influence over social media and online platforms, making them key players in spreading conservation messages (Fischer et al., 2023). Additionally, Gen Z is recognised for their wildlife conservational awareness and strong inclination toward sustainability, largely driven by global outlook and concern for future ecological well-being (Malikova, 2021).

The study used a simple random sampling method to select a representative sample of 377 individuals, with a 95% confidence level and a 5% margin of error. This sampling method ensures equal selection chances for all individuals in the target demographic, enhancing the study's generalizability to the broader population of young adults in the city.

In reference to sample size, Roscoe suggested that sample sizes of greater than 30 and fewer than 500 are considered suitable (Roscoe, 1969; Sekaran, 2016). Additionally, this study deduced that PLS-SEM has the ability to generate high-quality analysis with a larger sample size (Hair et al., 2019). Accordingly, a sample size of at least ten times the number of scaling items is considered suitable for statistical analysis. There were 37 items in this research ($37 \times 10 = 370$). As a result, the sample size ought to exceed 370. As a result, 400 respondents received the questionnaire from September to December 2024. In the end, 377 respondents submitted completed surveys that could be analyzed.

This study adopts a quantitative research approach using Partial Least Squares Structural Equation Modeling (PLS-SEM) to test the proposed theoretical framework based on the TPB. Partial Least Squares Structural Equation Modeling (PLS-SEM) is appropriate for this research due to its ability to handle complex models with multiple variables and limited sample sizes (Lowry & Gaskin, 2014). It is particularly suitable for exploring relationships among latent variables such as attitudes, subjective norms, perceived behavioral control, knowledge, experience, and conservation intentions. The analysis was conducted using SmartPLS software, which allows for robust path analysis and validation of the measurement and structural models.

4. Results

4.1. Descriptive statistics

A total of 377 responses were collected. With a sample size exceeding 370, this study has sufficient statistical power to account for the various factors involved in SEM when evaluating the research hypothesis and model fit. Table 1 provides the demographic information of the participants. Among the 377 respondents, 47.5% were male and 52.5% were female. All participants belonged to the Gen Z age group, with 24.4% being students, 25.2% office workers, 23.3% freelancers, and the remainder in other categories.

Table 1. Sample data (source: by authors)

Items	Classification	Sample amounts	Percentage (%)
Generation	Gen Millennials	0	0
	Gen Z	377	100
Gender	Male	179	47.5
	Female	198	52.5
Occupation	Students	92	24.4
	Office worker	95	25.2
	Freelancer	88	23.3
	Other	102	27.1
Residence	Ho Chi Minh City	377	100
	Other	0	0
Income	Under 200 USD per month	53	14.1

Table 3. Fornell-Larcker criterion (source: by authors)

	ATP	SN	PBC	KN	EX	BI	BE
ATP	0.821						
SN	0.32	0.753					
PBC	0.141	0.602	0.865				
KN	0.076	0.345	0.105	0.814			
EX	-0.101	0.301	0.152	0.089	0.795		
BI	-0.123	0.154	0.372	-0.139	0.08	0.846	
BE	0.025	0.103	0.438	-0.142	-0.141	0.114	0.751

the structural model, highlighting the predictive power of the factors and revealing the R^2 and f^2 values.

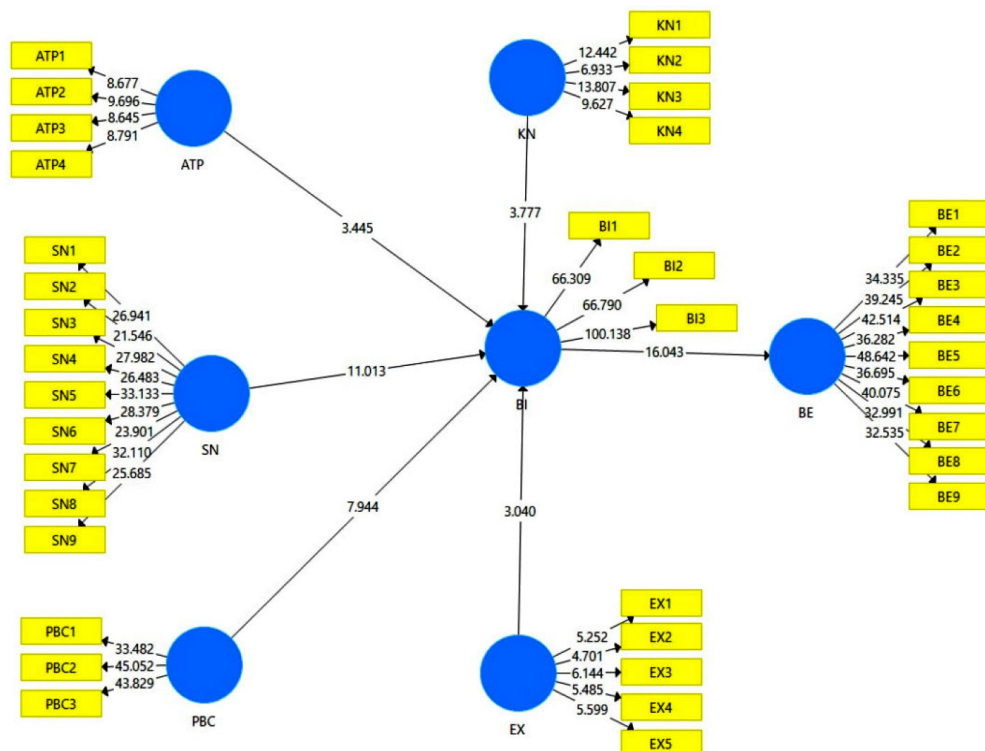
The study's hypotheses were tested using the bootstrapping technique, which confirmed the robustness of the proposed structural model. Table 4 shows significant effects between the exogenous and endogenous constructs. The most significant link was between SN and BI (H2), where $\beta = 0.446$, $t = 11.013$ and $p < 0.001$. Highly

significant effects were reported in H3, between PBC and BI ($\beta = 0.355$, $t = 7.944$ and $p < 0.001$) and in H6 between BI and BE ($\beta = 0.602$, $t = 16.043$ and $p < 0.001$). Additionally, significant effects were found in H1 between ATP and BI ($\beta = 0.179$, $t = 3.445$, and $p < 0.01$), in H4 between KN and BI ($\beta = 0.188$, $t = 3.777$, and $p < 0.001$), and in H5 between EX and BI ($\beta = 0.187$, $t = 3.04$, and $p < 0.01$) (Figure 2).

Table 4. Hypothesis testing (source: by authors)

Hypothesis	Relation	Original Sample (O)	Standard Deviation (STDEV)	T-Statistics (O/STDEV)	p-values	R-square	f-square
H1	ATP → BI	0.179	0.052	3.445	0.001	0.361	0.052
H2	SN → BI	0.446	0.041	11.013	***		0.316
H3	PBC → BI	0.355	0.045	7.944	***		0.199
H4	KN → BI	0.188	0.05	3.777	***		0.057
H5	EX → BI	0.187	0.062	3.04	0.002		0.056
H6	BI → BE	0.602	0.038	16.043	***	0.393	0.569

Notes: $T > 1.95$, *** $p < 0.001$.

**Figure 2.** Measurement and structural model (source: by authors)

5. Discussion

The study incorporated both classical TPB factors (attitudes, subjective norms, perceived behavioral control) and expanded predictors, such as knowledge and past experiences, into a comprehensive model of conservation behavior. The calculated R^2 value indicated that the model demonstrated high predictive accuracy by combining the effects of the independent variables (expanded TPB components) on the dependent variables (BI and BE). As a result, subjective norms and perceived behavioral control were identified as the key driving factors behind Generation Z's pangolin conservation intentions in Vietnam. The study advances the existing body of research by demonstrating that while attitudes, knowledge, and experience have a positive influence, they are less impactful than social and control-related factors in the context of pangolin conservation.

SN is a key factor influencing individuals' behaviors, as it reflects the influence of their social environment, including peer groups, family, and media. According to previous studies (Dybsand & Stensland, 2022), SN significantly impacts behavior intention because individuals are often motivated by the desire to conform to the expectations of those around them. In the context of Gen Z's conservation intentions, for example, if peers or family members strongly support environmentally friendly actions like rejecting products from pangolins or engaging in wildlife conservation activities, young individuals are more likely to engage in these behaviors. According to the findings in this study, SN provides the social pressure or approval that encourages individuals to align their behaviors with what is considered acceptable or valued by their social groups. Therefore, it could be said that the stronger the social influence from others, the more likely individuals are to participate in behaviors such as sustainable or conservation events.

The findings showed that PBC relates to an individual's perception of how easy or difficult it is to perform a particular behavior. This variable reflects the perceived ease of engaging in an activity based on available resources, time, and personal abilities. Research suggests that PBC plays a critical role in shaping behavior intention (Dybsand & Stensland, 2022) as individuals are more likely to engage in activities when they believe they have the ability and resources to do so. In the context of this study, if Gen Z perceives that attending conservation actions such events is easy, affordable, and accessible – through low-cost tickets, convenient locations, or flexible scheduling – they are more likely to follow through. Similarly, if young people perceive that they are not limited by time constraints and financial obstacles, they are more inclined to adopt this behavior. Thus, PBC impacts behavior intention by addressing the perceived ease of completing the action, and when individuals feel they can control the outcome, they are more likely to engage in the behavior. Understanding the role of SN and PBC can be highly beneficial for government bodies, NGOs, and policymakers in promoting

conservation behaviors among younger generations. SN can be leveraged by showcasing community support and involving influential figures to create social pressure, encouraging individuals to align with conservation actions. Meanwhile, PBC can be enhanced by reducing barriers and providing accessible resources, such as easy ways to participate in pangolin protection efforts. By ensuring that conservation behaviors are seen as socially acceptable and achievable, these campaigns can increase participation and foster a culture of sustainability.

However, the results in the study contrast with a prior study by (Zhang et al., 2022), which found that subjective norms typically exert the weakest influence on behavioral intentions. In Vietnam, where illegal wildlife trade has been a critical environmental and legal issue, there is growing public awareness and social discourse condemning the consumption of endangered species. Thus, aligning oneself with conservation efforts is increasingly seen not only as an ethical choice but also as a socially commendable action, further elevating the role of subjective norms.

Moreover, the strong predictive relationship between behavioral intentions and actual conservation behavior reaffirms the robustness of the extended TPB framework. It suggests that by effectively enhancing conservation intentions – particularly through social and control-based interventions – organizations can more reliably foster tangible conservation actions among younger generations.

6. Limitations

The study also has its limitations. Firstly, the focus on a single demographic group – Gen Z in Ho Chi Minh City – limits the generalizability of the findings to broader populations or different geographical contexts. Additionally, the study relies heavily on self-reported data, which may introduce biases such as social desirability or inaccurate recall of past experiences. Finally, while the TPB framework is a valuable tool, it has been critiqued for its emphasis on rational decision-making, which may overlook emotional or unconscious influences on behavior. Future research could consider incorporating these aspects to enrich the predictive power of the model. Secondly, attitudes, knowledge, or past experiences related to wildlife conservation or pangolins, while still having a positive impact, exert a relatively weak influence. They do not affect the intention to engage in pangolin conservation behavior as strongly as subjective norms or perceived behavioral control. The result is contradictory to the previous study (Aipanjiguly et al., 2003). Future research could be conducted to further explore and bridge the existing gaps in this area.

7. Conclusions

This study contributes significantly to understanding the factors influencing pangolin conservation intentions, especially among Generation Z in Vietnam, by applying and extending the TPB. The findings confirm that subjective norms and

perceived behavioral control are the most powerful predictors of conservation intentions. These results highlight the critical role of social influences (e.g., peer pressure, family, media) and the perceived feasibility of engaging in conservation efforts in shaping the behaviors of young people toward pangolin protection. This insight is valuable for policymakers and conservationists seeking to design interventions that tap into social dynamics and empower individuals by increasing their perceived control over conservation actions. By expanding the TPB framework to include socio-psychological factors, it lays a foundation for more effective conservation strategies tailored to the unique characteristics and motivations of younger generations.

The findings can be practically applied to design more effective conservation campaigns targeting Gen Z. Specifically, initiatives should focus on strengthening positive social influences, such as encouraging support from peer groups, families, and popular media figures, and enhancing individuals' perceived behavioral control, for example, by providing clear, accessible ways to participate in conservation activities. Environmental education programs can also integrate knowledge-sharing with opportunities for real-world engagement, allowing young people to feel both informed and empowered to act. More specifically, conservation organizations can apply these findings to implementing community-building social media campaigns where individuals are encouraged to share their conservation actions for pangolins and receive recognition from peers or public figures. Creating "conservation challenges" on platforms like TikTok or Instagram, where Gen Z participants creatively engage in wildlife protection activities and spread awareness, could also be an effective approach. Simultaneously, organizing offline activities such as interactive events, volunteer programs, field trips to wildlife sanctuaries, or conservation workshops in schools would enhance perceived behavioral control, as young people would see that they can make real contributions to conservation efforts. In addition, integrating conservation education into formal curricula or extracurricular programs using experiential learning methods, such as role-playing games, project-based learning, or field experiences, can engage students while delivering knowledge and building positive personal experiences. These experiences help reinforce self-efficacy, a critical factor in the development and maintenance of conservation behaviours. Finally, partnering with KOLs and influencers who resonate with Gen Z can significantly amplify conservation messages. Since Gen Z is highly responsive to social trends and advice from admired figures, using emotional storytelling and viral social media campaigns, rather than merely information, can create a strong social ripple effect that boosts conservation intentions and actual behaviors within the youth community.

Acknowledgements

I am deeply grateful to the University that has provided support for collecting data for the project.

Disclosure statement

The authors have stated that they do not have any potential competing interests that could influence the outcomes or interpretation of this study.

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APPENDIX – Measurement items

Section 1: Demographic Information

Question	Multiple Choice
What generation do you belong to?	☐ Gen Millennials ☐ Gen Z ☐ None of the above
Your biological sex:	☐ Male ☐ Female ☐ Prefer not to disclose
Currently, you are:	☐ Student ☐ Office worker ☐ Freelancer ☐ Other
Currently, you live in:	☐ Ho Chi Minh City ☐ Other provinces/cities
Your income is:	☐ Under 200 USD per month ☐ 200 USD to 400 USD per month ☐ 400 USD to 800 USD per month ☐ Over 800 USD per month

Section 2: Awareness, attitudes, and intentions towards pangolin conservation activities

Construct	Indicators	Source
ATP: Attitude towards pangolins and their conservation		
ATP1	Participating in pangolin conservation activities is the right thing to do.	(Han & Kim, 2010)
ATP2	I believe that protecting pangolins is an important part of maintaining balance in nature.	
ATP3	Protecting pangolins makes me feel proud.	
ATP4	I feel positive about supporting pangolin conservation campaigns.	
SN: Subjective norms		
Personal norms		
SN1	I feel a responsibility to participate in the protection of pangolins.	(Han & Kim, 2010)
SN2	I believe that supporting pangolin conservation campaigns is the right thing to do.	
SN3	If I don't participate in pangolin protection, I will feel regretful or guilty.	
Descriptive norms		
SN4	I think many people in my community care about pangolin conservation.	
SN5	I see more and more people getting involved in pangolin protection activities.	
SN6	Participating in pangolin conservation is a common practice in the society I live in.	
Imperative norms		
SN7	Most people who are important to me think I should participate in pangolin protection.	
SN8	People I respect would want me to contribute to pangolin conservation campaigns.	
SN9	Close people to me would appreciate my actions if I support pangolin conservation.	
PBC: Perceived Behavioral Control		
PBC1	My participation in pangolin conservation entirely depends on me.	(Han & Kim, 2010)
PBC2	I am confident that I can contribute to pangolin protection through small actions (e.g., sharing information, donating).	
PBC3	I believe I have enough information and opportunities to participate in pangolin conservation campaigns.	
KN: Knowledge about pangolin conservation		
KN1	I know that pangolins are currently one of the most trafficked species worldwide.	(Yang et al., 2022)
KN2	I know that pangolins play an important role in maintaining ecosystem balance.	

Construct	Indicators	Source
KN3	I know that pangolin products are banned in international trade under the CITES Convention.	
KN4	I know that pangolins are legally protected in many countries, including Vietnam.	
EX: Experiences related to pangolin conservation		
EX1	I have participated in pangolin conservation activities through online campaigns.	(Yang et al., 2022)
EX2	I have attended local wildlife conservation events related to pangolins.	
EX3	I have donated financially or volunteered for pangolin conservation organizations.	
EX4	I have watched or shared posts or videos related to pangolin protection on social media.	
EX5	I have researched information about laws protecting pangolins.	
BI: Intention to participate in pangolin conservation		
BI1	I intend to participate in awareness-raising campaigns about pangolin conservation in the near future.	(Han & Kim, 2010)
BI2	I intend to contribute (time, finances, or effort) to pangolin conservation activities in the future.	
BI3	I intend to share or spread messages about pangolin conservation within my community or on social media.	
BE: Pangolin conservation behavior		
BE1	I directly participate in pangolin conservation events or campaigns.	By authors
BE2	I donate financially, time, or effort to pangolin conservation organizations.	
BE3	I share information, articles, or videos about pangolin protection on social media.	
BE4	I participate in educational or advocacy activities to raise awareness about pangolin conservation.	
BE5	I refuse to buy or use pangolin-related or wildlife products.	
BE6	I engage in online groups or communities related to pangolin protection.	
BE7	I encourage friends or family members to participate in pangolin conservation activities.	
BE8	I follow and stay updated on pangolin conservation organizations to support their work.	
BE9	I adopt an environmentally friendly lifestyle to indirectly contribute to pangolin and biodiversity conservation.	