



Exploring the impact of goals and motivation on young consumers' sustainable plastic management behavior using the Theory of Reasoned Goal Pursuit

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ABSTRACT

Despite literature suggesting the importance of goals and motivation in pro-environmental behavior, its implication for predicting consumers' sustainable plastic management behavior (SPMB) is limited. This paper adopted the Theory of Reasoned Goal Pursuit (TRGP) to predict young consumers' SPMB, which includes plastic consumption reduction and proper disposal of plastic waste. Data was collected by surveying 336 respondents from a developing country - Bangladesh. Partial least square-based structural equation modeling (PLS-SEM) was used to analyze data. The result shows a significant impact of active procurement and approval goals on attitude and subjective norms, respectively, that lead to the formation of motivation. Furthermore, it was found that individuals' motivation significantly impacts their intention, eventually leading to pro-environmental behavior (i.e., SPMB). This research contributes by providing deeper insight into the underlying mechanism of how the active procurement goal (i.e., pro-environmental goals), active approval goal, and motivation interact with other factors to reshape individuals' SPMB. In addition, this paper provides further evidence on the implication of TRGP in habitual type pro-environmental behavior context. Finally, this paper offers solid suggestions for practitioners to promote circular economy practices at the consumer level to fight against plastic pollution.

1. Introduction

Plastic waste is one of the major threats to nature, including climate and marine life. The amount of plastic in the ocean is projected to be tripled by 2040 (UN, 2022). According to a study in 2022, approximately 46 % of total plastic waste ended up in landfills, and 19 % was mismanaged globally (OECD, 2023). This number is severe for single-use plastic, as around 85 % of single-use plastic goes to landfills or is mismanaged (UNEP, 2023). In 2019, plastic generated 1.8 billion tons of greenhouse gas, which was 3.4 % of global emissions (UNEP, 2023). Another study reveals that plastics comprise about 5–12 % of the world's total waste generation (20–30 % by weight) and 60–80 % of marine derbies (Kibria et al., 2023).

Whereas developed countries focus on controlling plastic pollution via strict regulations and ensuring proper facilities, these aspects are loosely imposed in developing countries (Ackerman and Levin, 2023; Khan et al., 2019). To tackle plastic pollution, researchers addressed the importance of reshaping consumers behavior toward Sustainable Plastic Management Behavior (SPMB), which includes adopting circular economy practices, such as reducing plastic consumption, reusing, proper disposing and recycling of plastic waste, to mitigate plastic pollution (Allison et al., 2022; Dijkstra et al., 2020). This highlights the importance of understanding the factors that foster SPMB, which is lacking in developing countries context (Khan et al., 2019).

The current literature explored several theories to predict pro-environmental behavior. Among different theories, the Theory of

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Planned Behavior (TPB) (Ajzen, 1991) is primarily used in literature to predict waste management and recycling behavior (Geiger et al., 2019). TPB considers that an individual's behavior results from reasoned thinking (Ajzen, 1991). However, the predicting accuracy of TPB is criticized in habitual behavior (e.g., purchasing plastic bags, waste separation, recycling) context, given that habitual behavior does not require much systematic and controlled thinking (Ajzen and Kruglanski, 2019). In addition, Ajzen and Kruglanski (2019) argued that models like TPB do not provide deeper insights into why a person performs similar behavior repeatedly. To address these limitations of TPB, Ajzen and Kruglanski (2019) highlighted the importance of personal goals that motivate people to deliberately perform specific actions repeatedly for long periods.

Referring to the Goal Systems Theory (GST), human behavior is certainly directed by personal desire, motivation, and goal (Kruglanski et al., 2002). Kruglanski and Szumowska (2020) underscored the importance of personal goals driving habitual behavior. However, the latest meta-analysis and literature review articles (Concari et al., 2020; Concari et al., 2022; Geiger et al., 2019; Varotto & Spagnoli, 2017) show a lack of consideration of goal and motivation as a predictor of pro-environmental behavior including SPMB. In addition, prominent theories (i.e., TPB, Theory of Interpersonal behavior, Norm Activation Model, Theory of Reasoned Action, and Value Belief Norm) widely adopted in literature did not consider goals and motivation as precursors of pro-environmental behavior. Therefore, it could be surmised that an individual's goals and motivation have not received sufficient attention in the literature to predict pro-environmental behavior. Despite scholars emphasizing the importance of individual goals and motivation to shape consumer behavior, their underlying mechanism to form pro-environmental behavior is yet to be explored, which could be viewed as a research gap.

Recently, Ajzen and Kruglanski (2019) proposed the Theory of Reasoned Goal Pursuit (TRGP), combining the TPB and GST, where personal goals and motivation are included in the well-established TPB model. Ajzen and Kruglanski (2019) argued that TRGP potentially could provide a better explanation of habitual type pro-environmental behavior, which was later supported by Concari et al. (2023) on the waste separation behavior of residents in two cities in the Netherlands. However, the implication of TRGP in a pro-environmental behavioral context is still nascent and requires further research, which could be identified as another research gap. As individuals' pro-environmental behavior is impacted by their goals and motivation to pursue the goal, additional study is required to solidify our understanding of the applicability of TRGP to predict pro-environmental behavior, especially for SPMB in developing countries context.

To address these research gaps, this paper aims to adopt the TRGP to explore the SPMB of Generation Z in a developing country - Bangladesh. It is to be noted that Bangladesh is one of the top fifteen countries for generating mismanaged plastic waste and releasing plastic waste into the ocean (Meijer et al., 2021). Hence, the country requires urgent actions to reduce plastic consumption and to dispose of plastic waste properly, facilitating the recycling rate. As the behavior of Generation Z influences the behavior of other age groups (Wood, 2022), reshaping their behavior could benefit society most.

This research contributes by 1) providing further empirical evidence to enhance our understanding of the impact of goals and motivation on pro-environmental behavior, 2) verifying the predictive capability of TRGP on habitual pro-environmental behavior (i.e., SPMB), and 3) providing policymakers with valid mitigating measures to fight against plastic pollution in a developing country context.

The rest of the paper is organized as follows: providing relevant theoretical information and developing hypotheses in Section 2. Section 3 presents an overview of research context and research design. Section 4 summarizes the result of the empirical study, and Section 5 further discusses the findings. Finally, Section 6 highlights the contribution of this paper and the scope of future research.

2. Theoretical background and hypotheses development

Although TPB is widely used in literature to predict human behavior in diverse contexts, it is criticized for lack of predicting accuracy in some instances. The TPB model performs best when the behavior requires thorough planning, reasoning, and proper attention (Staats, 2003). Fishbein and Ajzen (2011) suggested that TPB is open to including additional factors as long as the new factor adequately impacts the behavioral intention and/or actual behavior and satisfies some specific criteria, such as compatibility to specific behavior, independence from other predictors and applicability to a wide range of behavior. Hence, using an extended model of TPB by incorporating additional factors to predict pro-environmental behavior has been prevalent among researchers. Table 1 summarizes the literature that used extended TPB to explain SPMB. Based on Table 1, it could be posited that extending TPB using goal or motivation as added constructs is scant in the literature.

One of the limitations of TPB is that it may show low prediction accuracy for certain habitual behaviors that do not require considerable thinking but instead could be done intuitively (Ajzen and Kruglanski, 2019). Considering the limitation of TPB, Ajzen and Kruglanski (2019) proposed the Theory of Reasoned Goal Pursuit (TRGP), combining the TPB and GST. According to TRGP, goals are the primary driver that motivates people to perform specific actions. In this respect, Ajzen and Kruglanski (2019) addressed two types of goals: procurement goals and approval goals. The procurement goal aims to achieve or experience the benefits or target outcomes by performing certain actions (i.e., reducing weight or improving mental health by going to the gym regularly). Meanwhile, the approval goal focuses on gaining others' approval or appraisal by performing specific actions (i.e., impressing family members or receiving their appraisal by going to the gym regularly). In TRGP, these goals need to be active. If the goals are not activated, related behavior might not be initiated or influenced by an individual's goals (Concari et al., 2023).

According to TRGP, people tend to form more positive attitudes toward a particular behavior when the perceived benefits seem very likely to happen (i.e., the result of active procurement goals [APG]). For instance, people may not start reducing plastic consumption unless they see it as a means to reduce ocean plastic waste and help marine life. Attitude, a person's positive or negative perception of a certain action, is formed by knowledge, personal feelings, values, or emotions (Razali et al., 2020). Lou et al. (2022) addressed that having a positive attitude toward household waste separation will enhance individuals' willingness to recycle household waste. In this study's context, consumers may generate favorable attitudes toward SPMB if they possess active goals to realize SPMB-associated benefits, such as alleviating plastic-borne pollution and diseases, addressing water pollution, and aiding marine life. Hence, we put forward the following hypothesis.

H1a. : Active procurement goal (APG) positively impacts attitude (ATT) toward SPMB.

Similar to APG, active approval goals (AAG) stimulate subjective norms. For instance, a person may perceive that reducing plastic consumption and properly disposing of it will be a means to achieve appraisal or approval of important others that could be linked to subjective norms. Subjective norms refer to a person's assessment of other's reactions to specific actions (Razali et al., 2020). Ajzen (1991) inferred that human behavior is impacted by peer or social pressure that could be further guided by sociocultural norms, religious guidelines, and group beliefs. Hence, Ajzen and Kruglanski (2019) underscored the positive correlation between AAG and subjective norm within TRGP, leading us to propose the following hypothesis.

H1b. : Active approval goal (AAG) positively impacts subjective norms (SN).

Another vital construct in TRGP is the motivation for a particular behavior, as a higher level of motivation leads to forming strong

Table 1
Overview of key relevant literature in SPMB.

Author and year	Context	Country of study	Variables used	Findings
Shin et al. (2024)	Single-use plastic consumption reduction behavior	USA	ATT, SN, PBC, EA, MN, INT	ATT, PBC, and MN significantly impact the intention of reducing the consumption of single-use plastic
Hu et al. (2024)	Plastic waste disposal behavior	Japan	ATT, SN, PBC, MN, waste sorting knowledge, government policy	MN, waste sorting policy, and government policy significantly impact waste disposal behavior
Jia et al. (2023)	Plastic waste recycling behavior	Bangladesh	ATT, SN, PBC, INT, MN, Perceived sufficiency of knowledge and policy	ATT, SN, PBC, and MN impact the recycling intention. The impact of MN was found to be stronger than other factors.
Mu et al. (2023)	Plastic consumption reduction behavior	China	ATT, SN, PBC, MN, EA	ATT, SN, MN, EA impact intention to reduce plastic consumption
Heidbreder et al. (2023)	Plastic consumption reduction behavior	Germany	ATT, SN, PBC, MN, collective efficacy, Sufficiency orientation	MN and PBC are the strong drivers of intention to reduce plastic consumption
Sun and He (2023)	Single-use plastic consumption reduction behavior	China	ATT, PBC, emotion, normative social influence, informational social influence	PBC, emotion, normative social influence, and informational social influence significantly impact the intention to reduce single-use plastic consumption
Liao and Xing (2023)	Plastic waste recycling behavior	China	ATT, SN, PBC, MN, trust, social network	All factors significantly impact plastic waste recycling behavior. PBC weakens the impact of SN on recycling behavior.
Nguyen (2022)	Plastic bag consumption reduction behavior	Vietnam	ATT, SN, PBC, MN, AC, SR, INT	ATT and MN strongly impact the intention to reduce plastic consumption
Söderberg et al., (2022)	Plastic waste recycling behavior	Sweden	ATT, SN, PBC, MN	ATT, PBC, and MN significantly impact

Table 1 (continued)

Author and year	Context	Country of study	Variables used	Findings
Khan et al. (2019)	Plastic waste recycling behavior	Pakistan	ATT, SN, PBC, MN, AC	recycling behavior SN and AC significantly impact the recycling intention

intentions for a certain action. Motivation could be viewed as a force that instigates an individual’s behavior to satisfy their needs (Westbrook and Black, 2002). Ajzen and Kruglanski (2019) argued that certain actions’ perceived benefits or outcomes form motivation. According to the information-motivation-behavioral (IMB) model, motivation can be categorized as personal or social. Personal motivation relates to individuals’ attitudes and perceived outcomes, whereas social motivation is related to subjective norms and others’ approval (Seacat and Northrup, 2010). Therefore, the TRGP emphasizes that attitude and subjective norms impact the formation of motivation, proposing the following hypotheses.

H2a. : Attitude (ATT) positively impacts motivation (MT).

H2b. : Subjective norm (SN) positively impacts motivation (MT).

Earlier research argued that motivation is a robust immediate determinant of intention. Several empirical studies showed that individuals’ motivation leads to the formation of recycling intention, which, in turn, induces pro-environmental behavior (Aydin & Aydin, 2022; Kumar & Yadav, 2021; Liu & Yang, 2022). Here, pro-environmental behavior, SPMB, was measured as self-reported (not observed) behaviors, where participants describe their behaviors and perceptions based on their recollection and self-assessment. Accordingly, the following hypotheses are depicted.

H3. : Motivation (MT) positively impacts intention (INT).

H4. : Intention (INT) positively impacts sustainable plastic management behavior (SPMB).

Another vital construct addressed in the TRGP is perceived behavioral control (PBC). PBC refers to the degree of comfort or convenience to perform certain actions. In this context, PBC could be perceived as the availability of paper bags or products without plastic packages and bins or facilities at convenient locations to dispose of plastic waste. Several studies highlighted the impact of PBC on intention and behavior in the waste recycling context (Islam et al., 2024; Razali et al., 2020; Sabbir et al., 2023; Yuan et al., 2016). Indeed, some scholars identified a significant impact of PBC on behavior directly rather than mediated by intention (Aboelmaged, 2021; Mohamad et al., 2022; Pikturienė & Bäumlé, 2016; Xu et al., 2017). This is because waste sorting and recycling behavior are habitual, and people do it habitually or intuitively without requiring systematic thinking (Concari et al., 2023). Hence, similar to the TPB, Ajzen and Kruglanski (2019) emphasized the impact of PBC on both intention and behavior within TRGP, leading us to the following hypotheses.

H5a. : Perceived behavioral control (PBC) positively impacts intention (INT)

H5b. : Perceived behavioral control (PBC) positively impacts sustainable plastic management behavior (SPMB)

Though TPB only addresses the impact of TPB on intention and behavior, one of the latest meta-analysis papers (Hagger et al., 2022) indicates that individuals are less likely to act out of their intention when PBC is compromised. For instance, despite having positive intentions, a person can leave plastic waste outside in an open space due to the lack of

bins for disposing of plastic waste. Hence, TRGP proposed the moderating impact of PBC on the motivation-intention and intention-behavior relationships (Ajzen and Kruglanski, 2019), suggesting the following hypotheses.

H5c. : Perceived behavioral control (PBC) moderates the impact of motivation (MT) on intention (INT)

H5d. : Perceived behavioral control (PBC) moderates the impact of intention (INT) on sustainable plastic management behavior (SPMB)

The following Fig. 1 illustrates the research overview and hypotheses.

3. Methodology

3.1. Research context: plastic pollution in Bangladesh

Bangladesh is one of the densely populated countries. An estimation shows that around 73,000 tons of plastic waste end up in the Bay of Bengal daily. According to a study (Khatun et al., 2023), about 89 % of plastic waste is mismanaged in the coastal areas of Bangladesh.

The capital of Bangladesh, Dhaka city, was the second-most polluted city from 2018 to 2021 in terms of air pollution (The World Bank, 2021). About 646 tons of plastic waste is collected daily in Dhaka, which is 10 % of all waste generated in Bangladesh. Only 37.2 % of the plastic waste in Dhaka is recycled, while 48 % reaches landfills, and the rest is either dumped in rivers or discarded in drains and other areas of the city (The World Bank, 2021). The average per capita plastic consumption in Bangladesh has increased from 3 kg (kg) (in 2005) to 9 kg (in 2020) per year. In Dhaka alone, the average consumption of plastic has increased from 9.2 kg in 2005–22.25 kg per year in 2020 (The World Bank, 2021).

The National Action Plan for Sustainable Plastic Management targets recycling 50 % of plastics by 2025, reducing plastic waste generation by 30 % by 2030 from the 2020/21 baseline (The World Bank, 2021, Khatun et al., 2023). Hence, the municipality of Dhaka City requires urgent action to understand how to motivate residents to reduce plastic consumption in their daily lives. In addition, around 40–60 % of the waste generated in Dhaka city remains uncollected (Jerin et al., 2022). The town has become notorious for finding waste on the street due to its residents' irresponsible behavior (Habib et al., 2021; Jerin et al., 2022). Hence, practitioners must find the best ways to inspire people -to dump waste in designated places properly.

3.2. Research design

This research adopted a deductive approach, where the hypotheses outlined in the previous section were tested quantitatively. All the measurement items were adopted from past studies to ensure content

validity. Table 2 presents all the constructs and relevant measured items used for this study. Data was collected based on the items presented in Table 2, using a survey-based questionnaire following a 5-point Likert scale, where 1 indicates 'strongly disagree', 2 indicates 'disagree', 3 indicates 'neither agree nor disagree', 4 indicates 'agree' and 5 indicates 'strongly agree'. First, a pilot study was conducted among three academics and 30 target group respondents (i.e., young consumers aged 18–30) to improve the clarity and remove ambiguity of the questionnaires. Based on their feedback, adjustments were made before the final study.

Data was collected from 347 university students in the target group using surveys. The objectives of the study were briefly described to respondents before they started filling out the questionnaire. Researchers were present on-site during the data collection to assist respondents with any confusion related to the questionnaire. After initial screening, data from 336 respondents were considered for further analysis. Using G*Power version 3.1 software (Faul et al., 2009), considering effect size 0.15, significance criteria 0.05, and power 0.95, the minimum sample size appears to be 153. Hence, the collected data from 336 satisfies the minimum sample size. Regarding the demographic information of the respondents, around 34 % were female, whereas 66 % were male. Regarding the age group, around 90 % of the respondents were between 18 and 24 years old, and the remaining 10 % of respondents were between 25 and 30 years.

Data were analyzed using a two-step approach: measurement and structural model, as suggested by Hair et al. (2019). At first, the reliability and validity of the theoretical model were checked to assess its accuracy. After that, the partial least square-based structural equation modeling (PLS-SEM) technique was used to test the hypotheses and check the causal relationship between dependent and independent variables. SPSS and SmartPLS (version 3) software were used to conduct all the analyses. In this study, 2000 bootstrap subsamples were used to analyze model assessment measures.

4. Result and analysis

4.1. Measurement model assessment

Before the analysis of the structural model, a reflective factor model or measurement model analysis was performed to analyze the validity and reliability of the constructs. The measurement model showed that five items had to be removed as their outer loadings were below the threshold value of 0.708 (Hair et al., 2019). After removing APG3, SN4, SN5, PBC3, and ATT4, the resulting 28 items were considered to estimate the structural model for hypotheses testing, which are presented in Table 3.

The measurement model demonstrated an appropriate internal consistency level of the constructs. The construct reliability and validity

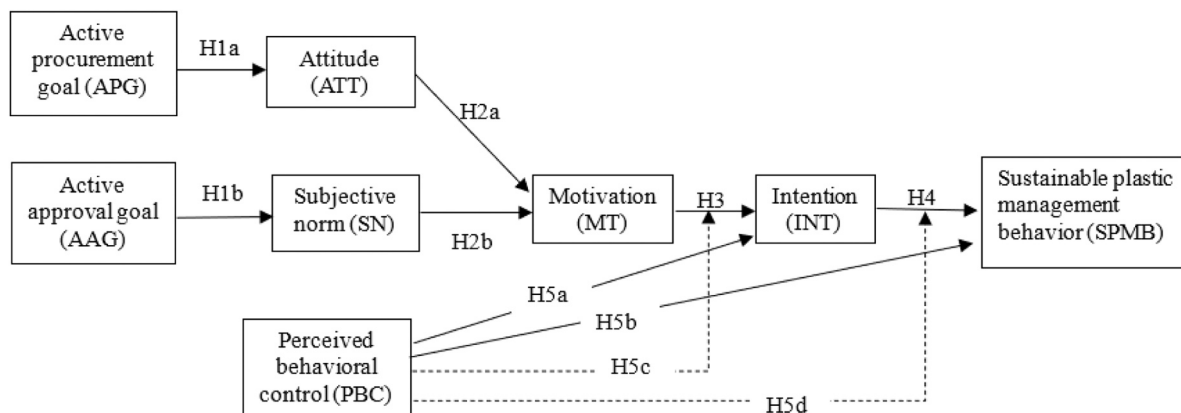


Fig. 1. Research overview and hypotheses.

Table 2
Constructs and items.

Constructs	Code	Items	Reference
Attitude (ATT)	ATT1	Plastic is bad for the environment	Khan et al. (2019); Yuan et al. (2016), Razali et al. (2020)
	ATT2	Reducing plastic consumption is good for the environment	
	ATT3	Reducing plastic consumption and disposing of plastic waste properly is an excellent idea	
	ATT4	Properly getting rid of plastic waste helps in recycling	
Subjective norms (SN)	SN1	My family members and friends often try to reduce their plastic consumption (i.e., avoid plastic packages, polybags, etc.)	Taufique & Vaithianathan (2018); Khan et al. (2019); Aboelmaged (2021)
	SN2	My family members and friends often dispose of plastic waste properly	
	SN3	My family members and friends encourage me to dispose of plastic waste properly and reduce its consumption	
	SN4	If I see my close persons (family, friends, idols) dispose of plastic properly, I will also do so	
	SN5	My local community encourages me to dispose of plastic waste properly and reduce its consumption	
Perceived behavioral control (PBC)	PBC1	I easily find waste bins or trash boxes to dump plastic waste	Khan et al. (2019); Lou et al. (2022); Razali et al. (2020)
	PBC2	I easily find alternatives to plastic packages (i.e., paper bags, cups)	
	PBC3	Reducing plastic consumption is costly (reverse-coded)	
	PBC4	Reducing plastic consumption is convenient	
	PBC5	Disposing of plastic properly in convenient	
Active procurement goal (APG)	APG1	I have a personal goal to work for a cleaner world/climate change/global warming	Concari et al. (2023); Hamilton et al. (2022)
	APG2	I have a personal goal to work for marine life (i.e., fish and water species) to reduce water pollution	
	APG3	I have a personal goal to contribute to nature either by choosing a relevant career, donating or supporting environmental activities	
	APG4	I want to contribute to the world by reducing plastic consumption and disposing of it properly	
	APG5	I want to contribute to marine life (fish and water species) by reducing plastic consumption and disposing it properly	
Active approval goal (AAG)	AAG1	To me, it is important if my family members appreciate me for engaging in environmental activities	Concari et al. (2023); Hamilton et al. (2022)
	AAG2	To me, it is important if my peers appreciate me for engaging in environmental activities	
	AAG3	To me, it is important if my family members/partner/friends/colleagues appreciate me for my effort to reduce plastic consumption and dispose of waste properly	
Motivation (MT)	MT1	Right now, I am motivated to reduce plastic consumption	Liu and Yang (2022); Concari et al. (2023); Hamilton et al. (2022)
	MT2	Right now, I am motivated to dispose of plastic waste properly in day-to-day life	
	MT3	I get motivated by watching peers/family members engage in reducing plastic consumption and disposing of waste properly	
	MT4	I get motivated when the government encourages me to reduce plastic consumption and dispose of waste properly	
	MT5	I get motivated when my idols/favorite celebrities encourage me to reduce plastic consumption and dispose of waste properly	
Intention (INT)	INT1	I am willing to dispose of plastic waste properly and reduce its consumption in my daily life	Liu and Yang (2022); Zhang et al. (2019); Khan et al. (2019)
	INT2	I am willing to encourage my family and friends to reduce plastic consumption and dispose of it properly	
	INT3	I am willing to put extra effort into reducing plastic consumption and dispose of it properly	
	INT4	I am willing to encourage others to reduce plastic consumption and dispose of it properly	
Sustainable plastic management behavior (SPMB)	SPMB1	I always dump plastic waste in bins or appropriate places	Razali et al. (2020)
	SPMB2	In case of unavailability of bins, I always carry plastic waste with me	

result in Table 3 showed that all Cronbach’s Alpha values range from 0.667 to 0.887, which is acceptable (Taber, 2018). The composite reliability values appeared between 0.823 and 0.928, which is higher than the threshold value of 0.70, as suggested by Fornell and Larcker (1981). The average variance extracted (AVE) values are above the threshold value of 0.50 (Hair et al., 2019), ranging from 0.538 to 0.811.

The Fornell-Larcker Criterion was used to assess the discriminant validity of the constructs. As shown in Table 4, all the inter-construct correlation values were found to be below the square root of AVE of

all the respective constructs, meeting the requirement for satisfactory discriminant validity (Fornell and Larcker, 1981). Moreover, The Hetrotrait Monotrait correlations [HTMT], a Monte Carlo simulation-based method, was employed to analyze the discriminant validity. The highest correlation value was found to be 0.804, where the cut-off point is 0.900 (Hair et al., 2019). This result provided further evidence of the discriminant validity of the constructs. Additionally, the VIF score for all items was checked and found below 5, indicating the absence of substantial multicollinearity (Hair et al., 2019).

Table 3
Results of the measurement model.

Constructs	Items	Factor loading	Mean	Standard deviation	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
APG	APG1	0.802	3.71	0.943	0.800	0.828	0.621
	APG2	0.721	3.65	0.923			
	APG4	0.844	3.85	1.322			
	APG5	0.781	4.07	0.775			
AAG	AAG1	0.895	3.93	0.886	0.883	0.928	0.811
	AAG2	0.925	3.93	0.841			
	AAG3	0.881	4.04	0.882			
ATT	ATT1	0.812	4.58	0.813	0.821	0.881	0.714
	ATT2	0.945	4.38	0.856			
	ATT3	0.768	4.42	0.857			
SN	SN1	0.834	3.34	1.044	0.839	0.903	0.756
	SN2	0.865	3.18	1.074			
	SN3	0.908	3.14	1.279			
MT	MT1	0.879	4.02	0.846	0.887	0.917	0.689
	MT2	0.904	4.07	0.842			
	MT3	0.786	4.06	0.825			
	MT4	0.766	4.07	0.899			
	MT5	0.807	3.86	1.043			
PBC	PBC1	0.732	2.95	1.313	0.716	0.823	0.538
	PBC2	0.726	3.02	1.161			
	PBC4	0.716	3.50	0.904			
	PBC5	0.759	3.46	0.952			
INT	INT1	0.849	3.96	0.813	0.880	0.917	0.735
	INT2	0.863	4.03	0.770			
	INT3	0.873	3.95	0.820			
	INT4	0.844	4.08	0.805			
SPMB	SPMB1	0.873	3.96	0.811	0.667	0.857	0.750
	SPMB2	0.859	3.67	1.072			

Table 4
Fornell-Larcker Criterion result.

	AAG	SPMB	APG	ATT	INT	MT	PBC	SN
AAG	0.901							
SPMB	0.566	0.866						
APG	0.673	0.563	0.788					
ATT	0.236	0.253	0.271	0.845				
INT	0.555	0.618	0.603	0.287	0.857			
MT	0.683	0.555	0.629	0.287	0.625	0.830		
PBC	0.301	0.345	0.261	0.164	0.221	0.244	0.733	
SN	0.411	0.350	0.370	0.184	0.279	0.404	0.525	0.870

4.2. Structural model assessment

After finding the measurement model as reliable and valid, the structural model was estimated. Table 5 shows the estimated path model's resulting path coefficient (β -value), t-value, and p-value. Based on Table 5, the hypotheses- H1a, H1b, H2a, H2b, H3, H4, H5b, and H5d are supported as they have p-values less than 0.05 and t-values greater than 1.96 (two-tailed).

It was identified that predictors can explain 42.8 % variation ($R^2 = 0.428$) in SPMB. Based on Fig. 1, it was hypothesized that SPMB is directly impacted by intention and PBC. The hypotheses testing shows that both intention and PBC significantly impact SPMB, supporting hypotheses H4 ($INT \rightarrow SPMB, \beta = 0.558, p < 0.001$) and H5b ($PBC \rightarrow SPMB, \beta = 0.231, p < 0.001$) (see Table 5). The associated β -value of H4 was found to be higher compared to H5b, indicating the direct impact of intention on SPMB is higher than PBC.

Regarding intention, results suggest that predictors explain 39.5 % of the variation ($R^2 = 0.395$) in the intention of SPMB. According to

Table 5
Hypothesis test results.

Paths	Path coefficient (β -value)	t-value	p-value	Status
H1a: APG -> ATT	0.271	4.386	***	Supported
H1b: AAG -> SN	0.411	8.365	***	Supported
H2a: ATT -> MT	0.220	3.582	***	Supported
H2b: SN -> MT	0.364	7.776	***	Supported
H3: MT -> INT	0.630	13.116	***	Supported
H4: INT -> SPMB	0.558	11.325	***	Supported
H5a: PBC -> INT	0.050	0.907	0.182	Not supported
H5b: PBC -> SPMB	0.231	4.381	***	Supported
H5c: Moderating Effect of PBC on MT -> INT	0.077	1.308	0.095	Not supported
H5d: Moderating Effect of PBC on INT -> SPMB	-0.072	1.702	0.044	supported

Note: *** indicates the p-value is less than 0.001

Table 5, individual’s motivation (MT) significantly impacts their intention, supporting H3 (MT → INT, β = 0.630, p < 0.001), whereas the impact of PBC on intention was identified as insignificant, not supporting H5a (PBC → INT, β = 0.050, p = 0.182).

The result shows that an individual’s motivation (MT) is significantly impacted by ATT and SN, supporting hypotheses H2a and H2b (H2a: ATT → MT, β = 0.220, p < 0.001; H2b: SN → MT, β = 0.364, p < 0.001). In addition, the impact of APG and AAG on ATT and SN, respectively, was found to be significant, supporting hypotheses H1a (APG → ATT, β = 0.271, p < 0.001) and H1b (AAG → SN, β = 0.411, p < 0.001).

Regarding the moderating effect of PBC, it was observed that its moderating effect on the MT-INT relationship was insignificant, not supporting H5c (moderating impact of PBC on MT-INT, p > 0.05). However, the moderating effect of PBC on the INT-SPMB relationship was identified as significant, supporting H5d (moderating impact of PBC on INT-SPMB, β = - 0.072, p < 0.05), indicating a negative moderating effect of PBC.

The total indirect effects and specific indirect effects of APG and AAG on both INT and SPMB were sought and summarized in **Table 6**. Based on **Table 6**, both APG and AAG posit significant indirect effects on INT and SPMB. Comparing the β-value, the total indirect effect of AAG on INT and SPMB was found to be higher compared to APG (APG → INT: β = 0.038, APG → SPMB: β = 0.021; AAG → INT: β = 0.094; AAG → SPMB: β = 0.053). Additionally, the specific indirect effect of APG and AAG on INT and SPMB on their respective paths was also found to be significant. The β-value of AAG was found to be higher compared to APG on similar paths (APG → ATT → MT → INT: β = 0.038; APG → ATT → MT → INT → SPMB: β = 0.021; AAG → SN → MT → INT: β = 0.094; AAG → SN → MT → INT → SPMB: β = 0.053). Therefore, it could be understood that both APG and AAG significantly impact INT and SPMB, and the effect of AAG is higher than that of APG.

5. Discussion

Based on the result, it was found that APG and AAG significantly impact attitude and subjective norm, respectively, as suggested in TRGP, supporting the earlier research by [Concari et al. \(2023\)](#). Additionally, this research found a significant impact of attitude and subjective norms to form motivation. In other words, both APG and AAG impact motivation via attitude and subjective norm, respectively. Analyzing the indirect effects, both APG and AAG significantly impact intention and SPMB, where the impact of AAG was found to be strong compared to APG.

Based on the TRGP, [Ajzen and Kruglanski \(2019\)](#) concluded that several active goals can be competitive, and both APG and AAG do not necessarily need to be dominant to form the motivation. The recent study by [Concari et al. \(2023\)](#) found a significant impact of APG on motivation via attitude and a non-significant impact of AAG on

motivation mediated by subjective norms. [Concari et al. \(2023\)](#) provided reasoning that waste separation is conducted within a household, thereby lacking an impact on a person’s social image. However, Generation Z has comparatively less emotional intelligence but a higher affection, attention, and approval-seeking mentality from their surroundings ([Machová et al., 2020](#)). Hence, the impact of AAG on motivation, intention, and SPMB was found to be significant in this study. Some of them are motivated to engage in pro-environmental activities when they see their close friends and family members acting accordingly. Similarly, if some of them do not receive the expected appraisal from their surroundings, they would prefer to refrain from pro-environmental activities, resulting in a higher level of impact of AAG. However, further study is required to generalize our understanding of the impact of both APG and AAG in a pro-environmental behavioral context.

The result also suggests that having a strong motivation significantly impacts forming intention that ultimately leads to SPMB. This supports the earlier studies ([Concari et al., 2023](#); [Hamilton et al., 2022](#); [Kumar & Yadav, 2021](#); [Liu & Yang, 2022](#)) concur that motivation is a strong indicator of intention. Hence, the result supports adequate predictive power of including goal and motivation within TPB in a pro-environmental behavioral context, which is the primary focus of TRGP.

Regarding PBC, the results showed a significant impact of PBC on behavior with an insignificant effect on forming intention. The result contradicts the TPB reasoning and the findings by [Jia et al. \(2023\)](#) and [Khan et al. \(2019\)](#) in a similar plastic pollution context from developing countries’ perspective. However, several other studies ([Aboelmaged, 2021](#); [Mohamad et al., 2022](#); [Pikturnienė & Bäumlle, 2016](#); [Xu et al., 2017](#)) showed an insignificant impact of PBC on forming intention for household waste sorting and recycling behavior. Indeed, there is a lack of waste disposal facilities in Bangladesh. Therefore, given that the reaction time for plastic waste disposal behavior is instantaneous, ensuring that dumping facilities are located nearby may directly stimulate the proper disposal of plastic waste in the bins rather than forming the intention and then shifting to actual actions.

The moderating impact of PBC on the relationship between motivation and intention was found to be insignificant, which contradicts the predictions of the TRGP. However, a similar result was observed by [Hamilton et al. \(2022\)](#) in the context of healthy lifestyle behaviors and gym facility usage. Conversely, the moderating impact of PBC on the intention to engage in SPMB was found to be significant. However, the β-value was negative, suggesting a negative moderating impact. This phenomenon could be explained by the influence of normative goals, grounded in the Goal Framing Theory ([Lindenberg and Steg, 2007](#)). [Onel and Mukherjee \(2017\)](#) stated that individuals with high pro-environmental goals (i.e., normative goals) tend to recycle despite lacking facilities or extra costs. Therefore, it could be perceived that people with higher levels of active pro-environmental goals (in this study, active pro-environmental goals are embedded in APG) are driven by their motivation to perform SPMB despite the lack of convenience. However, further studies are suggested to clarify our understanding of PBC’s moderating role in motivation-intention and intention-behavior relations.

The study’s findings could further be explained by the Mindsponge Theory, which emphasizes how information vitality and its processing mechanism impact individuals’ behavior ([Vuong, 2016](#)). According to the Mindsponge Theory, when people acknowledge new information or cultural values, they feel comfortable with the latest ideas or values that impact reshaping their behavior ([Vuong, 2016](#); [Vuong & Napier, 2015](#)). Similarly, by acknowledging information about eco-knowledge and/or caring for nature, people become comfortable with pro-environmental actions that gradually form pro-environmental goals as a core value within a person ([Khuc et al., 2023a](#); [Nguyen et al., 2023](#)). The whole process could be simplified as a linkage of knowledge (i.e., receiving eco-knowledge), action (i.e., performing pro-environmental activities),

Table 6
Total indirect effects and specific indirect effects.

Paths	Path coefficient (β-value)	t-value	p-value	Status
Total indirect effects of APG and AAG on INT and SPMB				
APG → INT	0.038	2.183	0.015	Supported
APG → SPMB	0.021	1.987	0.024	Supported
AAG → INT	0.094	4.007	***	Supported
AAG → SPMB	0.053	3.566	***	Supported
Specific indirect effects of APG and AAG on INT and SPMB				
APG → ATT → MT → INT	0.038	2.183	0.015	Supported
APG → ATT → MT → INT → SPMB	0.021	1.987	0.024	Supported
AAG → SN → MT → INT	0.094	4.007	***	Supported
AAG → SN → MT → INT → SPMB	0.053	3.566	***	Supported

Note: *** indicates the p-value is less than 0.001

and contribution (i.e., developing pro-environmental culture, core value, goals) (Tran et al., 2024).

According to Vuong (2016), it is a time-consuming and difficult process to abandon a core value or transform a new value into a core value. Due to the complexity of the transformation process, despite receiving the same information, people's pro-environmental behavior could differ based on their information processing (i.e., thinking) mechanism (Vuong, 2016). When pro-environmental goals (i.e., APG in this research context) become a core value within individuals, it positively influences their attitudes toward relevant actions (Khuc et al., 2023a; Nguyen et al., 2023). In a similar vein, this research demonstrated that having a pro-environmental goal (i.e., APG) impacts individuals' attitudes and, in turn, motivates them to pursue SPMB. Additionally, social information affects a person's beliefs (Wu et al., 2024). Aligning with the Mindsponge Theory, if an individual's surroundings influence him/her to perform pro-environmental behaviors, the transformation process of acknowledging and feeling comfortable with these practices could be faster (Wu et al., 2024). As AAG could be linked to the adoption of behavior based on the viewpoint of surroundings (i.e., people tend to impress their close persons and get motivated by their activities), this research found a significant indirect impact of AAG on SPMB through subjective norms.

6. Implications and future research directions

6.1. Theoretical contributions

This paper has two distinct theoretical contributions. Firstly, one of the research gaps addressed is the lack of understanding of how goals and motivation impact pro-environmental behavior. In this respect, the former study by Concari et al. (2023) noted a significant influence of APG and a non-significant effect of AAG on pro-environmental behavior. This research signifies the impact of both APG and AAG and the subsequent motivation to stimulate pro-environmental behaviors (e.g., SPMB). Therefore, this paper augments our understanding of the importance of both active procurement and appraisal types of goals and their underlying mechanism with other cognitive factors to prompt pro-environmental behavior.

Secondly, Ajzen and Kruglanski (2019) theoretically argued that the TRGP could provide an improved explanation capability of habitual type pro-environmental behavior. However, empirical studies are scant to support the argument. This paper is one of the very few studies that provide further empirical evidence on the applicability of TRGP in the SPMB context, indicating its robustness in the habitual type pro-environmental behavioral context.

6.2. Practical implications

This paper identifies intention as the main precursor of SPMB, and intention is significantly impacted by APG and AAG. Therefore, policymakers and higher authorities must take necessary measures to cultivate intrinsic long-term goals related to environmental aspects within Generation Z. Examples of such measures could be adequately communicating the harmful impact of plastic pollution and individuals' responsibilities and developing an academic curriculum. Such measures could foster the development of APG within individuals. In addition, efforts by young generations to mitigate plastic waste – such as opting for reusable items like water bottles and coffee cups or starting environmental clubs in schools – should be recognized. This recognition could include featuring stories about individual or group efforts in local or community newspapers. Such actions can help instill AAG among these individuals, motivating them to continue their pro-environmental behaviors. Furthermore, offering monetary rewards to volunteer organizations and youngsters for their contribution could encourage them to pursue their APG and AAG, as Ajzen and Kruglanski (2019) opined that without proper motivation, active goals could be neutralized.

This research also found that PBC directly impacts SPMB and moderates the impact of intention on SPMB. Therefore, attention should be drawn to developing sufficient facilities to dispose of plastic waste, ensuring the availability of paper bags and products within paper packages. Such measures would accelerate individuals' SPMB. Overall, the focus should be given to critical factors identified by this study that potentially impact the adoption of circular economy practices at the micro-level (i.e., reducing plastic consumption and disposing of plastic waste properly by consumers) to tackle plastic pollution effectively.

Furthermore, this study is one of the pioneering efforts to expand the understanding of Generation Z's SPMB, an essential aspect of environmental culture in Bangladesh, where the youth constitutes a substantial portion of the total population. Identifying mechanisms to trigger Generation Z's SPMB is crucial for fostering a promising future, as they are the vanguard of sustainable change. Indeed, building an environmental culture is advantageous to society (Khuc et al., 2023b), and this study partly contributes to enabling such a transition by offering critical insights for informed policy-making aimed at encouraging plastic waste mitigation.

6.3. Limitations and future research directions

This paper only explores the Generation Z's SPMB. Further study could be directed at conducting similar studies in diverse contexts to understand if demographic variables like age, gender, and ethnicity moderate the impact of goals toward pro-environmental behavior. In addition, data was collected using a survey that risks a mismatch of self-reported and observed behavior. Hence, conducting longitudinal experimental research would have provided better accuracy of the current findings. Furthermore, this paper only showed the interrelation of goals and motivation with other cognitive factors to predict pro-environmental behavior. Future studies could be conducted to understand the interrelation of goals with both cognitive and noncognitive factors to form pro-environmental behaviors. In other words, further research could be initiated to extend the TRGP by including noncognitive factors, such as habit and moral norms.

CRedit authorship contribution statement

Md Hasibul Islam: Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Formal analysis, Data curation, Conceptualization. **Md. Zahidul Anam:** Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Formal analysis, Data curation. **Md. Tamzidul Islam:** Writing – review & editing, Project administration, Data curation. **Md. Mahiuddin Sabbir:** Writing – review & editing, Visualization, Conceptualization.

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.

Data availability

Data will be made available on request.

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