

Deterministic Modelling for Evaluating Sustainable Consumers' Attitude Regarding Recycling of Plastic Waste in Bangladesh

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Abstract

The current study was conducted to determine the factors that affect the recycling behaviour of waste in Bangladesh. Using a survey-based quantitative research approach, data were collected through an online survey of regular social media users who are active in this subject. A total of 288 valid responses were conducted with SmartPLS 4.0 for structural equation modeling. The findings revealed that the recycling attitude towards plastic waste was found to be largely determined by Perceived Behavioral Control and Subjective Norms. Most of the respondents in this study were students. In this study, the sample has considered the maximum from the urban area. Side by side, there are only 288 samples. Steps to take: diversify the sample population, increase sample size and use a mixed methods approach. consider cultural and contextual factors. The value of Cronbach's alpha was determined to be greater than 0.7. It pointed out that these research tools are reasonably appropriate. As environmental concerns about the growing human health and welfare for people around the world, due to the degradation caused by plastic waste, are becoming more environmentally attitude, perceived behavioral control, subjective norms and recycling behaviour. Therefore, understanding the determinants. affect the recycling behavior of consumers, especially in a developing country. Since most existing studies were performed in a developed setting. The research uses the Theory of Planned Behaviour (TPB) model and the Tri-component Attitude model, in which the researcher attempted to discover what factors impact on recycling behaviour. Three hypotheses are propounded in the study. The influence of some variables, such as attitudes, perceived behavioral control and subjective norms, was examined on the recycling behaviour of various consumers. The results of the current research suggest that perceived behavioural control predicted recycling behaviour and that the subjective norm is also significantly related to recycling behaviour. Otherwise, the rest of the determinants, affective, cognition and conation have a significant impact on Sustainable Consumers' Attitude Regarding Recycling of Plastic Waste in Bangladesh.

Keywords: Conation, Perceived Behavioural Control, Recycling Behaviour, Subjective Norms.

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1.1 Introduction

Attitude refers to people's evaluations of persons, places, things or ideas. any object. The formation of attitudes is based on direct experience or persuasion by either party and occurs from others or the media. It is relevant with particular interest for psychology, since attitudes frequently direct behavior. The attitude toward any object forms a determining cause of the consumer's purchasing. This research is being conducted to assess the Sustainable Attitude towards Recycling of Plastic Pollution in Bangladesh.

However, Environmental pollution poses a significant threat to all forms of life, a concern that is well-documented in both theory and real-world observations [13]. Researchers contend that policymakers have increasingly emphasized the role of households in preserving the environment's sustainability, encompassing the intricate concepts of environmental pollution and climate change [37]. The preservation of our climate hinges on measures such as the reduction of fossil fuel usage and the adoption of alternative energy sources [32], decreased energy consumption [13], the promotion of eco-friendly dietary choices [24], recycling, and the practice of sustainable consumption [4]. Despite the importance of this behaviour, their widespread adoption remains far from universal. Consequently, this study aims to uncover the various factors influencing consumer behavior in sustainable recycling practices, particularly concerning plastic waste.

Over the past few decades, plastic production has exceeded a staggering 8 billion tons. By 2016, plastic consumption had surpassed 297.5 million tons, and it is projected that a staggering 12 billion tons of plastic will be deposited in landfills by 2025 [19]. This alarming trend is bound to exacerbate environmental pollution due to the presence of hazardous substances within plastics, such as Polycyclic aromatic hydrocarbons and polychlorinated biphenyls of these compounds' biphenyls, polybrominated diphenyl ethers, bisphenol, as well as nonylphenol [45]. Given the harmful elements contained in plastic, disposing of it haphazardly in soil is not a viable solution. The issue of plastic pollution is a global concern, as underscored by the United Nations, which has declared the environmental sustainability threat posed by plastic waste to be a peril of global proportions [11]. Hence, there exists a pressing need to deploy sustainable strategies aimed at shaping the conduct of end-users, such as the implementation of reverse logistics [30]. Reverse logistics is the term used to describe the process through which manufacturers retrieve or accept goods from consumers, a practice that can encompass recycling, waste management,

remanufacturing, or enhancing the quality of existing products [8]. While various studies have explored the recycling aspect of reverse logistics in different countries, including England [38], [22], [25], [7], and [19], limited research has delved into consumers' involvement in take-back programs [46]. The scarcity of literature addressing waste return emphasizes that consumers, particularly from the perspective of plastic recycling, have not received the due attention of environmentalists [7].

1.2 Identification of the Problem

The attitude-behavior correlation is significant since it should theoretically encapsulate a perception of a product and express positive or negative attitudes toward and behavioral tendencies. However, at the same time that we know how indiscriminately attitude and behavior are linked together, we also know that affected by other factors. A major problem is that while consumers generally express concern about plastic waste, their attitudes don't always translate into consistent, positive behavior like reducing consumption or proper disposal. Many consumers feel overwhelmed, frustrated, and uncertain about how to address the plastic crisis, despite wanting to do better. This gap between attitude and action contributes to the ongoing issue of plastic pollution. So, this investigated its relevant components empirically in the Bangladeshi context and proved to consumers. So, the findings of this study can assist policymakers and planners to create a more competitive brand in the market to choose.

1.3 Purpose of the Study

The investigation is mainly aimed at measuring the attitude of sustainable consumers towards Plastic Waste Recycling in Bangladesh. This study is therefore specifically aimed: *first*, to identify the various factors that are taken into account by their Bangladeshi customers while Plastic Waste in Bangladesh; *second*, to develop some hypotheses to test the significance level of considered determinants; and *lastly*, to classify a few recommendations for the creation of a favorable attitude of Bangladeshi consumers towards recycling of Plastic Waste.

1.4 Research Questions

According to the purpose, the following research questions have been formulated:

1. What are the determinants influencing sustainable consumers' attitudes regarding the recycling of Plastic Waste in Bangladesh?
2. How could we determine the significance level of the considered determinants?
3. What are the practical contributions and implementations of the research?

1.5 Importance of the Study

In Bangladesh, consumers have a generally positive attitude towards reducing plastic production, but behavioural adoption of recycling is hindered by various factors. While many people express willingness to purchase eco-friendly products and reduce single use plastics, practical barriers like the lack of waste management, limited availability of alternatives, and weak social norms impede actual recycling behavior. Improving waste management infrastructure, raising awareness and implementing supportive policies are crucial to translate positive attitude into effective recycling practices.

2.1 Theoretical Foundation and Hypothesis Formulation

The Theory of Planned Behavior (TPB) proposes that our attitude has three important determinants: our attitude towards the given behavior, the social or subjective norm related to that attitude, and our perception of our ability to control or carry out the attitude. In the present version of this theory, having a positive attitude towards a behavior and receiving social influence (subjective norm) are also motivations to perform that attitude. However, the actual intention to carry out the attitude only solidifies when we believe we have enough control or influence over the situation. To elaborate further on these ideas, we can refer, [1].

2.2 Attitude toward the Object

The Theory of Planned Behavior (TPB) utilizes a framework that canters around people's expectations and values to explain how attitudes toward a particular behavior are formed. Basically, it implies that the behavior is influenced by what one believes about what the immediate results of those actions will be or behavioral beliefs. A behavioral belief is an individual's judgment of the likelihood that engaging in certain behavior will result in a set outcome or experience. For example, someone may think that wearing a heart monitor (the behaviour) can discover heart arrhythmia (the result) or consider it uncomfortable (the experience). When you combine all these behavioural beliefs combine in affect the extent to which an individual's attitude toward the behavior is positive or negative. Simply stating, it is the positive and decreasing or

negative nature of each anticipated outcome or incident and the disposition as a whole, based on how the individual believes those outcomes or experiences will occur when they engage in the behavior, [1]. The TPB also predicts three key factors that determine a person's intentions.

Attitude, in this context, refers to how favorably or unfavorably someone evaluates or appraises the behavior in question. Numerous studies have confirmed the link between attitude and the intention to engage in a behavior, [28] [18] [25]. Individual experiences and mental processes play a significant role in shaping a person's inclination, whether positive or negative, towards a particular idea or subject. This notion is supported by research conducted [31], which suggests that our behavioural intentions are influenced by specific circumstances. When it comes to the intention to recycle, it is greatly impacted by an individual's favorable attitude towards pro-environmental and sustainable behavior. Such attitudes are formed as a response to personal judgment, as indicated by the work, [35].

In the realm of understanding human behavior, numerous studies have employed the concept of attitude, [21] [27]. Nevertheless, it should be mentioned that the results of these studies are somewhat mixed. Many studies have demonstrated the positive impact of attitude on one's behavioural intentions, as observed in the works of, [40] [43] [44] [45]. Nevertheless, it's important to acknowledge that there are also studies that present contrasting results.

2.3 Subjective Norm

There are two primary categories of normative beliefs, namely injunctive and descriptive beliefs, as detailed by [10]. Injunctive normative beliefs involve the anticipation or personal judgment regarding whether a specific individual or group (like friends, family, colleagues, or even authorities like a physician or supervisor) approves or disapproves of a particular behavior. On the other hand, descriptive normative beliefs concern one's beliefs about whether significant others in their social circle engage in the same behavior. Both of these belief styles account for an individual's general experience of social pressure, here further referred to as subjective norm, which affects how likely they are to engage in a given behavior, such as engaging in pro-environmental actions to conform with societal norms [1]. This concept of subjective norms plays a crucial role in motivating individuals to adopt sustainable and environmentally friendly behaviour, and it has been widely employed in various behavioural studies, particularly those related to recycling intentions. The majority of research findings indicate a significant impact of

subjective norms on recycling intentions, as shown in studies conducted by [19] [20] [23] [40]. However, it's worth noting that a few studies have presented conflicting results, such as those by [17] [38].

In essence, subjective norms reflect the extent to which individuals perceive social pressures encouraging or discouraging their engagement in a specific behavior. Numerous studies have previously incorporated subjective norms as a pivotal factor in examining recycling behavior, as seen in the works of [9] [36].

2.4 Perception

In the field of behavioural psychology and environmental studies, there is a widely embraced agreement that our attitudes, subjective norms, and perceived behavioural control substantially impact what we intend to do and the actual action. In much the same way that attitudes are built on accessible beliefs about behavior, and subjective norms are based on accessible normative beliefs, our perceived behavioural control is rooted in control beliefs. These, in turn, are grounded in various control beliefs, available or not, that can facilitate or impede action execution. These factors span skills and abilities, time, money, and other resources, help from others, and more. Thus, a control belief in and around the presence of some counterfactual factor at the time and situation in question incorporates an individual's judgment of the likelihood that this factor is likely to be a facilitator or a hindrance. Each of these control beliefs contributes to the overall perception of one's ability to carry out the behavior, in conjunction with the perceived power of those factors to either support or obstruct the behavior [1].

An individual's ability to decide is significantly influenced by how easily or with difficulty they can act. Additionally, the level of control a person believes they have over performed that behavior also influences their intention to engage in it. This concept of perceived behavioural control serves as a motivating force for individuals to adopt a pro-environmental and sustainable attitude. It has been a key predictor in numerous studies within similar contexts and has consistently yielded positive results, [4] [23] [40]. However, it's worth noting that some studies have yielded conflicting findings [19] [25]. Perceived behavioural control refers to an individual's anticipation of the ease or difficulty they will encounter when performing an attitude. This expectation is often influenced by past experiences and perceived barriers and obstacles. Many researchers have applied the concept of perceived behavioural control in studies related to recycling [2] [39]. For recycling

behaviour, the Theory of Planned Behavior has been widely adopted [6] [5] [29][9] [25]. Given those content constructs, we propose the *H1*.

H1: Consumers' subjective norm and perception positively impact on recycling behaviour

2.5 Tricomponent Attitude Model

This model is based on an attitude's three components, and these include: influences to form the attitudes. Those components are:

2.5.1 The Affective Component

A Consumer's mental process with respect to a product or brand is called the affective component of an attitude. These attitudes and feelings are often referred to as consumer. evaluative in nature. This means that they understand a person's attitudes and intentions; that is, although their explicit or conscious expressions. attitude object positively or negatively; and attitude accessibility (i.e., the degree to which the individual evaluates the attitude object as "positive" or as "negative", "good" or "bad"). Research indicates that such affective states might facilitate or amplify positive or negative experiences and that subsequent memories of such experiences may influence what one thinks about and how the person acts. Given this construct, we propose the *H2*.

H2: Consumers' affective component positively impacts on recycling behaviour

2.5.2 The Cognitive Component

Cognitive characteristics represent the first part of the Tricomponent Attitude Model in which a person's known as direct experience with, and communication from, others is the way in which individuals make sense of situations that affect them. The attitude object and information about it from different sources. This knowledge and perceived effects are usually in the form of beliefs (i.e., consumers believe) that the attitude object has lots of attributes and that this sort of behavior will produce these kinds of constituent attitude outcomes. However, Consumers think about the plastic waste differently than with respect to those attributes.

2.5.3 The Conative Component

Conation, the last element of the Tricomponent Attitude Model, is interested in the probability or propensity of a person to perform an action or behave in a certain way, specifically toward the attitude object. According to some interpretations, the conative element can simply consist of the Behaviour. In marketing and consumer research, the conative dimension is often regarded as a reflection of estimate of their estimated future satisfaction with product use. intention to buy. Given those constructs, we propose the **H3**.

H3: Cognition and conation both have a positive influence on recycling behaviour

2.6 Conceptual Framework of the Study

Since they are covert, attitudes cannot be directly observed. In other words, an attitude is a tendency to react, which results in actual behavior. The public always seeks to receive service on a variety of attributes. Not only traits but also affect, as well as cognition and conation, constantly impact to form the attitude of consumers toward an object. Agencies have an opportunity to benefit from consumers' attitudes, manifested by the invariance of consumer choice in response to their brand [20].

Figure 1. 1 demonstrates that subjective norms play a crucial role in motivating individuals to adopt sustainable and environmentally friendly behaviour and perceived behavioural control serves as a motivating force for individuals to adopt a pro-environmental and sustainable attitude. Otherwise, three components (affect, cognition, conation) effected on forming attitude towards the object. The framework represents that affective response is treated as a mediating effect on attitude formation, where cognitive and conation directly affect to form overall sustainable attitude towards recycling of plastic waste in Bangladesh

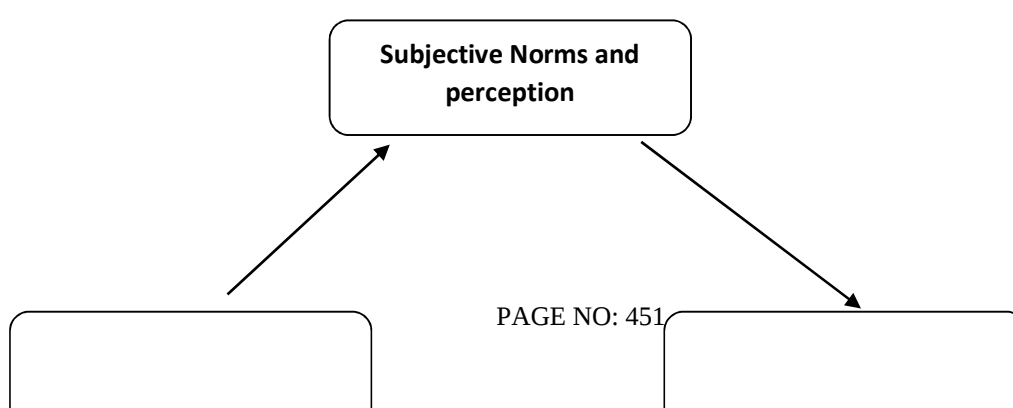


Figure 1.1 suggested hypothetical model for attitudes of consumers toward the recycling of plastic waste

3. Research Methodology

The purpose of this research is to analyze attitude formation in relation to waste plastic in Bangladesh, determined through examination of the level of subjective norms, perception, affect, cognition and conation of the consumers. For this study, we use a survey method. Details of the sample informants, data types, method of data collection and methods of data analysis are presented below.

3.1 Target Population

The study population is students of the Universities (Public and Private) and different professionals; university teachers, various businessmen, bankers, housewives and other government, non-government employees. Individuals residing in the metropolitan areas of Dhaka, Cumilla, and Mymensingh, aged between 18 and 33 years.

3.2 Sampling Method and Sample Size

Probability sampling method (Simple Random Sampling) is used in this research on customers' gender and occupation. The required sample size is calculated as indicated by the following formula:

$$n_{srs} = \frac{z^2 pq}{d^2} = \frac{(1.96)^2 \times 0.25 \times 0.75}{(0.05)^2} = 288$$

Where, n_{srs} refers sample size of simple random sampling

Here, n = required sample size

z = standard value of 1.96 at 95% confidence level

p = estimated proportion of the target population

d = margin of error at 5% (standard value of 0.05)

So required simple size = 288.

3.3 Types of Data

Both Primary and Secondary data are to be utilized to acquire actual findings of the research. Primary the field directly and secondary data was retrieved from the published materials of different organizations.

3.4 Method for Data Collections and Procedures

The Universities (Public and Private) and Professionals from diverse disciplines are using a series of structured questionnaires. On the first page of the questionnaire, the purpose of the study is stated. After that, some basic questions are included in the questionnaire. On the next page of the questionnaire picked the respondents are requested to turn over the page with information about the plastic waste of Bangladesh on sustainable behavior. To measure the consumers' cognition about the chosen attributes, **7-points Semantic differential** scaling ranging from very strongly believe to extremely disbelieve (**+3 to -3**) and neutral value 0 is used and the score is what I want to be written. Next, to measure the impact of consumers' cognition and conation on the chosen determinants, they on a scale from extremely poor to excellent (1-5) and queried to score to make their views known. Following this, a few results are elaborated upon and the respondents are also requested to respond to the questions intended for forecasting future impulses of consumers on plastic waste among the consumers of Bangladesh.

5-points Likert Scale is also used to measure the consumers' norms and perception of rating has been utilized and requested to scale from not important to very important **(1-5)**, circle the score to indicate their views. Nowadays, for the psychological and demographic, as well as six sensitive questions, are reported questionnaires below.

3.5 Data Analysis Procedures

Demographic data- age and gender, as well as profession have been collected, entered, and analyzed through descriptive analysis. The views of the respondents are considered in the light of the application: SmartPLS 4.00 Version, testing the hypotheses for measuring sustainable attitude development of recycling plastic waste in Bangladesh.

4.1 Demographic Profile of the Participants

Table 1 revealed that the total number of respondents is 288. There are 182 respondents who are male and 106 respondents are female. Also, we can 34.72% of respondents are below 18 years limits, 31.25% of respondents are between 18 to 25 years limit, 33.33% respondents are between 26 to 33 years limit and 0.69% respondents are above 33 years limits. Alongside 56.94% respondents are students, 27.77% respondents are job holder, 13.88% respondents are business person and 1.38% respondents are in other professions.

Table:1 Descriptive analysis of Demographic Profile

Variable	Category	Frequency	Percentage
Gender	Male	182	63.19
	Female	106	36.80
Age	Below 18	100	34.72
	18-25	90	31.25
	26-33	96	33.33
	Above 33	2	0.69
Profession	Student	164	56.94
	Business Person	40	13.88
	Job Holder	80	27.77

	Other	04	1.38
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Source: SPSS output from primary data

Overall, the demographic data suggest that the sample is primarily composed of young, unmarried, educated students, with relatively modest professional levels. This demographic context should be considered when interpreting the findings, as it may influence consumer attitudes and behavioural outcomes.

4.2 Summary of the Measurement Model

Both the reliability and validity of the measurement model were examined using factor loadings, Cronbach's Alpha (α), Composite Reliability (CR) and Construct Validity. Average Variance Extracted (AVE). Consistent with SEM standards, reliability was established and validated via Cronbach's Alpha and CR, and validity was tested via AVE for convergent validity and (b) the Fornell–Larcker criterion for discriminant validity.

Table 2. Summarizes the Results of the Measurement Model

Constructs	Items	Factor Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Affect	AFF1	0.896	0.912	0.944	0.850
	AFF2	0.938			
	AFF3	0.932			
Cognition & Conation	COG & CON1	0.883	0.824	0.895	0.740
	COG & CON 2	0.886			
	COG & CON 3	0.811			
	SNP1	0.714	0.703	0.835	0.628
	SNP2	0.835			

Subjective Norms and Perception	SNP3	0.824			
Attitude Formation toward the Object	AFO1	0.201	0.600	0.783	0.600
	AFO2	0.939			
	AFO3	0.937			

Source: SmartPLS 4.0

The reliability and validity of the constructs were examined for the measurement model. Table 2 presents the factor loadings (FL) for most of the indicators displayed strong factor loadings above the recommended threshold of 0.70 [14]. The Affect construct did especially well, as indicated by between 0.896 and 0.938, a Cronbach's Alpha of 0.912, a CR at the level of 0.944, and an AVE of 0.850, mutual exceeding the required goals and supported convergent validity as well as internal consistency and convergent validity.

Similarly, Cognition & Conation achieved acceptable results ranging between 0.811 and 0.886, Cronbach's Alpha = 0.824, CR (Composite Reliability) = 0.895 and AVE (average variance extracted) = 0.740, indicating strong reliability and validity. The construct Subjective Norms and Perception also obtained acceptable findings, loadings from 0.714 to 0.835, Cronbach's Alpha of 0.703 and CR of 0.835, and AVE of 0.628. Although slightly lower than the other constructs, these values remain within the acceptable range. In contrast, the dependent construct, Attitude Formation toward the Object (AFO), exhibited mixed results. While AFO2 (0.939) and AFO3 (0.937) loaded strongly, AFO1 showed a very weak loading (0.201), which is well below the threshold. This led to lower reliability scores, with Cronbach's Alpha at 0.600 and AVE at 0.600, indicating that AFO1 did not effectively measure the construct. According to standard PLS-SEM practices [14]. AFO1 should be considered for removal to enhance construct validity. Nonetheless, keeping AFO2 and AFO3 helps ensure the construct maintains adequate reliability and explanatory power.

4.3 Discriminant Validity Analysis

Discriminant validity was assessed following the Fornell-Lacker criterion and by comparing the square root of the AVEs with the correlations between constructs. As shown in Table 3, the root of the AVE of each construct (diagonal values) is larger than its relations between items and other constructs (off-diagonal). According to Table 3, Affect reported a square root of AVE value of

0.922, which is more than the correlation with Attitude Formation toward the Object (0.958), Cognition & Conation (0.775) and Subjective Norms and Perception (0.697). Likewise, Cognition & Conation yielded an $\sqrt{\text{AVE}}$ of 0.861, higher than correlations obtained with Affect (0.775), AFO (0.768) and SNP (0.695). In the and Perception was 0.703 and 0.775 (higher than the same way, Subjective Norms and Female 0.702. its relations with Affect (0.697), AFO (0.720) and Cognition & Conation (0.695).

Table 3. Evaluation of Discriminant Validity: Fornell-Larcker Criterion

	Affect	Attitude Formation toward the Object	Cognition & Conation	Subjective Norms and Perception
Affect	0.922			
Attitude Formation toward the Object	0.958	0.775		
Cognition & Conation	0.775	0.768	0.861	
Subjective Norms and Perception	0.697	0.720	0.695	0.793

Source: SmartPLS 4.0

4.4 Multicollinearity Test

To verify for multicollinearity problems, the Variance Inflation Factor (VIF) values of all measurement items were assessed. According to recommended guidelines, VIF values below 5 indicate that multicollinearity is not a concern, [14]. As shown in Table 4, the VIF scores for all indicators fall well within the acceptable range. The construct Affect recorded values between 2.582 and 3.674, while Cognition & Conation ranged from 1.560 to 2.227. Similarly, Subjective Norms and Perception showed lower VIF values, ranging from 1.255 to 1.497. For Attitude Formation toward the Object, VIF values ranged from 1.018 to 2.498.

Table 4. Multicollinearity Test (VIF Values)

Constructs	Items	VIF
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Source: SmartPLS 4.0

Affect	AFF1	2.582
	AFF2	3.674
	AFF3	3.573
Attitude Formation toward the Object	AFO1	1.018
	AFO2	2.498
	AFO3	2.478
Cognition & Conation	COG & CON 2	2.216
	COG & CON 3	1.560
	COG & CON1	2.227
Subjective Norms and Perception	SNP1	1.255
	SNP2	1.497
	SNP3	1.471

4.5 Structural Model Summary

After establishing the reliability and validity of the variables, we evaluated the structural model constructs [14]. Structural equation modelling was applied to assess both significant and non-significant relationships, thereby identifying which hypotheses were supported [3]. To ensure of robustness, we performed bootstrapping (5,000 sub-samples) to ensure that the size is still significant, the amount and the significance of path coefficients to be tested [33]. Path coefficients (β), t-values, and p-values were determined by a two-tailed test at a level of 0.05, using t 1.96 considered statistically significant. The results obtained are given in Table 5.

Table 5. Results of Hypothesis Testing

Path	Path coefficient (Original Sample)	t-Values	p-Values	Result
Affect -> Cognition & Conation	0.775	27.802	0.000	Accepted
Affect -> Subjective Norms and Perception	0.697	18.173	0.000	Accepted
Cognition & Conation -> Attitude Formation toward the Object	0.517	10.140	0.000	Accepted
Subjective Norms and Perception -> Attitude Formation toward the Object	0.360	6.580	0.000	Accepted

Source: SmartPLS 4.0

It is shown that both Cognition & Conation ($\beta = 0.775$, $t = 27.802$, $p < 0.001$) and Subjective Norms and Perception ($\beta = 0.697$, $t = 18.173$, $p < 0.001$). the recycling of plastic, both Cognition & Conation ($\beta = 0.775$, $t = 27.802$, $p < 0.001$) and Subjective Norms and Perception ($\beta = 0.697$, $t = 18.173$, $p < 0.001$), on knowledge of issues waste management influencing environmental protection behaviour, affective attitudes towards such behaviors, followed by pro-environmental behavior perceptions.

Both Cognition & Conation ($\beta = 0.517$, $t = 10.140$, $p < 0.001$) and Subjective Norms and Perception ($\beta = 0.360$, $t = 6.580$, $p < 0.001$) predicted significantly Attitude Formation toward the Object (AFO). Between the two, Cognition & Conation had the stronger effect, indicating that awareness and behavioural intentions are more decisive than social pressures in shaping sustainable attitudes.

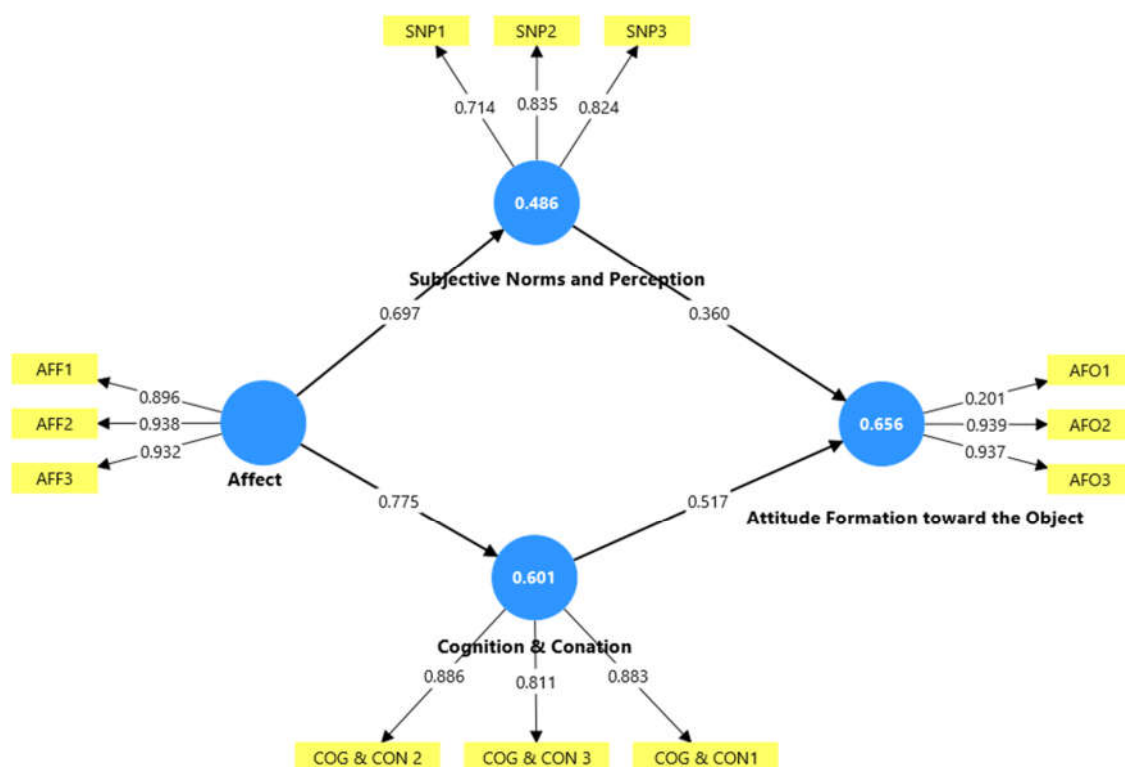


Figure 1. Structural Model

From the analysis, it is clear that all proposed relationships were significant. Affect strongly influenced both Cognition & Conation and Subjective Norms and Perception, showing the importance of emotions in shaping recycling behavior. Both predictors, in turn, significantly influenced Attitude Formation toward the Object (AFO), with cognition and conation exerting the stronger effect. This suggests that knowledge and behavioral intentions play a greater role than social influence in forming positive recycling attitudes (see Figure 1).

The structural equation model was tested to check the relationships assumed among the constructs. As shown in Figure 1 and Table 5, all four hypothesized paths were statistically significant, with path coefficients (β) in the expected positive direction. The results demonstrate that Affect plays a pivotal role in shaping recycling attitudes. The results show that Affect significantly influenced both Cognition & Conation ($\beta = 0.775$, $t = 27.802$, $p < 0.001$) and Subjective Norms and Perception ($\beta = 0.697$, $t = 18.173$, $p < 0.001$). This suggests that individuals' emotional responses toward recycling not only enhance their knowledge and behavioural intentions but also strengthen the influence of social norms and perceived expectations. In addition, both Cognition & Conation ($\beta = 0.517$, $t = 10.140$, $p < 0.001$) and Subjective Norms and

Perception ($\beta = 0.360$, $t = 6.580$, $p < 0.001$) had significantly positive effects on Attitude Formation toward the Object (AFO). Among these, cognition and conation exerted the stronger impact, indicating that awareness, reasoning, and behavioural intentions are more decisive than social influences in shaping positive attitudes towards recycling.

5. Limitations and Future Research Direction

Although a valuable discovery was made in this study, there were limitations of the present empirical research that must be recognized. The maximum respondents in this investigation is students. In this study, the sample has considered the maximum from the urban area. Thus, a further study is suggested to look into different age groups via online and offline surveys, including a survey on the travel site, to enhance the generalizability of our research model. All data have been collected by the authors via an online survey method. To conduct the study, we need to collect data from all levels of people, so that people's recycling intention can be observed better. One of the solutions to overcome generation bias in such studies may be clustering sampling across various ages, combining both paper-based and online surveys. Future research could increase the number of participants or sample size to raise the importance and the sample can better represent the general population. Further studies need to be performed in large, representative samples (probabilistic sampling) to confirm or disprove the observations reported in this study. By using these methods, it could increase the reliability, validity, consistency, and accuracy of the research.

6. Conclusion

This work is one of many empirical studies that have been made to assist public understanding of the nature and extent of environmental problems and to contribute towards a better quality of life with a growing care for the environment and intention to recycle plastic waste. As our natural environment is under more and more serious threat from plastic pollution health and welfare of millions of people around the world, people are increasingly aware of their perceived behavior control, subjective norms, affect, cognition, and conation regarding recycling behavior. Consequently, there is a need for further investigation to provide clarity about factors affecting consumers' attitudes towards sustainability, recycling plastic waste in Bangladesh. In fine we can freely say that consumers' sustainable attitude is influenced by some determinants. This strategic approach can lead to improve the positive attitude regarding recycling of plastic waste in Bangladesh.

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