The role of Theory of Planned Behavior (TPB) explaining recycling behavior: an emerging market perspective

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Abstract—This study aims to understand the role of Theory of Planned Behaviour (TPB) in the context of recycling behavior. The research followed a positivistic, deductive, and quantitative methodology. The study was conducted with a sample size of 467 using snowball sampling technique. Confirmatory factor analysis (CFA) was conducted to assess construct reliability, convergent validity, and discriminant validity in order to ensure reliability and effectiveness of the measurement model. The results show that overall model fit was acceptable and statistically significant. The study also reveals that, although TPB is considered to be widely acceptable model explaining most of the attitude–behavior relationship for many years, unable to predict the recycling intention adequately through various predictive variables such as attitude, subjective norms, and perceived behavioral control in this particular case. However, recycling intention itself is statistically significant in predicting actual recycling behavior. This study has potentially added insights into the existing literature through experimenting an established model which can be useful developing an effective and comprehensive model in future. It can also be used in various industries to find ways to develop recycling behavior through the lens of other potential factors such as external environment. As environment is also a priority agenda for the government and policymaker nowadays, this can assist them in making and implementing various effective and sustainable policies in future.

Index Terms—Consumer attitude, perceived behavioral control, recycling behavior, sustainable consumption, subjective norms.

I. INTRODUCTION

In the last few decades, concern for the natural environment has grown significantly in every domain of the society. Multiple studies show that 97 percent or more of actively publishing climate scientists agree that climate-warming trends over the past century are extremely likely due to human activities [12]. Among all human activities, garbage is a major contributor to global warming. For an instance, solid waste landfills are the single largest man-made source of methane gas in many countries [17]. The environment of developing country like Bangladesh has been deteriorating rapidly during the last couple of years. 7.70 million liters of liquid waste and 88 tons of solid waste are discharged each day from the tanneries alone [21]. [25] suggested that 40% of daily waste production is left in the street of Dhaka city (the capital of Bangladesh). Recycling is considered one of the effective ways to deal with this concern, contributes to municipal solid waste management by diverting materials which have an economic value from the main waste flow, thus reducing quantities of waste to be collected and disposed. This study explores recycling behavior in the context of an existing model, Theory of Planned Behavior (TPB) which is considered as one of the most widely used and influential models of the attitude–behavior relationship during the last 20 years [14]. Bangladesh, despite being one of the most densely populated countries in the world and prone to various natural and human made disasters, has experienced remarkable growth in socio-economic indicators in last two decades. However, only 15% of the total generated waste in Dhaka (mainly inorganic) amounting to 475 tons/day are recycled daily and savings through recycling in urban areas of Bangladesh is US $ 15.29 million/ year [33]. Alongside with safeguarding environment, recycling has social and economic contribution. In addition to building recycling infrastructure, it requires change in human behavior and carefully nurturing this behavior; we can ensure a better world for future.

The socio-economic indicators suggest that Bangladesh has experienced astonishing development and these exaggerated improved lifestyles and therefore, there is a high possibility that people are becoming more environmentally conscious day by day. In many cases, it is not just because they want to ensure positive contribution to the environment in general but also due to their concerned for personal wellbeing. As a matter of fact, this concern has even increased due to unlightened laws and regulations, hike in population etc. Food adulteration and contamination has widely fostered the consumer to consume green products especially food and related products [19]. As a result, many international and local companies are trying to address various eco-friendly behavior through various innovative marketing tools. However, the efforts are limited to certain products only such as food, power, electronics etc. Furthermore, lack of proper understanding of the concept and how this can be incorporated into consumption habit leads to shallow, disconnected, short term focused that may not benefit the companies and the community.

II. LITERATURE REVIEW AND RESEARCH FRAMEWORK

American Marketing Association (AMA) defines green marketing as 1. (Retailing definition: The marketing of...
products that are presumed to be environmentally safe. 2. Social marketing definition: The development and marketing of products designed to minimize negative effects on the physical environment or to improve its quality. 3. Environments definition: The efforts by organizations to produce, promote, package, and reclaim products in a manner that is sensitive or responsive to ecological concerns [3]. Three typical statements of green consumers are, first “identify myself as someone who is concerned with ‘green/environmental issues’”, second, “I purchase and consume green products”, and third, “I perceive my lifestyle as ‘green’” [26]. Many try to define sustainable consumption as consumption of ‘greener’ products; also referred to as green consumption [20]. Marketers often build on this view to develop and promote environmentally friendly choices such as organic and locally grown fruit and vegetables, recycled paper, alternative formulations for detergents, eco-friendly magazines or low-energy light bulbs. Some of the researches also focused on anti-consumption as an effective agent of sustainable living. They tried to define anti-consumption for sustainability as a practice of rejection, reduction and reuse and therefore, the challenge for sustainable consumption is to position sustainable practices alongside self-interested notions such as independence, beauty, quality or value for money [23].

Theory of Planned Behavior provides a framework for systematically investigating the factors which influence behavioral choices, and has been applied successfully to such diverse areas such as leisure choice, driving violations, investment decisions and dishonest actions [2], [8]. The theory, which was developed from the earlier Theory of Reasoned Action (TRA), assumes that people that people behave rationally, in that they consider the implications of their actions [1]. The TPB hypothesizes that the immediate determinant of behavior is the individual’s intention to perform, or not to perform that behavior. Intentions are, in turn, influenced by three factors [2]:

1. Attitude, the individual’s favorable or unfavorable evaluation of performing the behavior. 2. Subjective norm, the individual’s perception of social pressure to perform or not to perform the behavior. 3. Perceived behavioral control, a measure of the individual’s perception of their ability to perform the behavior in question.

Recycling is a behavior which requires considerable effort on the part of the individual as household waste must be sorted, prepared and stored [9], consequently the recycling decision is likely to be complex, and a number of factors may be taken into consideration. The TPB provides a theoretical framework for systematically identifying the factors which influence the recycling decision, and several studies have confirmed its utility for investigating the determinants of recycling behavior [10], [11], [13]. However, although there is considerable support for the TPB, several authors have argued that it does not adequately explain recycling behavior and have suggested that additional variables should be included within the model [9], [13].

A. Consumer attitude towards recycling

Consumer attitude is defined as a learned predisposition to respond consistently favorable or unfavorable manner and environmental attitude refers if this is measured in respect to the environment. Attitude is combined with someone’s belief and subjective evaluation of belief and its consequences. Numerous studies have identified factors that influence attitudinal beliefs of recycling or various environmental behaviors, in general [22], [30], [31]. In the TPB, an individual’s attitude toward a specific behavior is proportional to the sum of the salient beliefs about the relevant attributes and perceived consequences of performing the behavior and the person’s subjective evaluation of these attributes and consequences. It is hypothesized that:

H1: Positive specific attitude (ATT) toward recycling influences significantly to predict recycling intention (INT).

B. Consumer subjective norms towards recycling

Another element in the theory of planned behavior is subjective norm. The assumption is that people will be more inclined to engage in a certain behavior, e.g. recycling, if their peer groups believe it is the appropriate thing to do. However, some studies deliberately excluded subjective norm [28]. The study claims that subjective norm has not shown a strong link to behavior because prior studies have used the wrong measurement to capture the concept. Namely, studies refuting the usefulness of subjective norm in the theory of planned behavior mainly “use single item measures, as opposed to more reliable multi-item scales” [6]. The results of their meta-analyses match with previous studies which found subjective norm to contribute the least to explaining behavior. Still, attitude and subjective norm predict behavioral intentions which are directly linked to the performance of the behavior [2]. Thus, the following hypothesis is proposed:

H2: The greater the specific subjective norms (SN) towards recycling, the higher the intention for recycling (INT).

C. Consumer perceived behavioral control towards recycling

Perceived Behavioral Control measures an individual’s ability to perform the behavior being assessed and is one of the explanatory variables in the TPB, claims that intentions alone will directly predict behavior in situations in which an individual feel to have complete power over the behavior,
i.e. strong perceived behavioral control [2]. In situations where the individual feels uncertain about her/his control over the situation perceived behavioral control has a direct link to the behavior under question [2]. However, there is a gap between an individual’s assessment of perceived behavioral control and real control over the situation [6]. Thus:

H3: Perceived behavioral control (PBC) toward recycling significantly influences recycling intention (INT).

D. Consumer intention towards recycling

Lastly, behavioral intention supported by its three variables as suggested in TPB can predict behavior. In the TPB, intentions are viewed as behavioral plans that in conjunction with appropriate opportunities and resources enable attainment of a behavioral goal. However, previous studies criticize the TPB for not clarifying the exact nature of the relationship between intention and behavior [14]. Most research on intention has not defined the construct and that research that has defined behavioral intention has framed it in terms of expectation [32]. Many define behavioral intention as a person’s subjective probability that he/she will perform some behavior [2]. Many researches also suggest that if an individual gives substantial thought to a behavior, for example the advantages and disadvantages of performing the behavior, then intentions are likely to be well formulated and consistent with behavior [7]. In contrast, if little attention is given to the formulation of the intention then it is likely to be poorly formed and less likely to be consistent with behavior. It is hypothesized that:

H4: Positive recycling intention (INT) significantly influences actual recycling behavior (ARB).

III. METHODOLOGY

In this research, the researchers addresses the relevance and application of Theory of Planned Behavior (TPB) in explaining recycling behavior from one of the developing market contexts, Bangladesh. Considering the nature of this study, descriptive and causal research approaches have applied in this study. Part of this study has addressed the phenomena by looking into the associations among variables. Correlation between exogenous variables such as attitude, subjective norms, and perceived behavioral control and endogenous variable such as intention was analyzed as part of testing hypothesis. At the second stage, causal relationship between intention and recycling behavior was tested. This research has followed snowball sampling technique as getting access to the eco-friendly consumer in the context of developing country like Bangladesh is very challenging as the size of the population is very small and socio-cultural barriers. When operationalizing the main survey, one obvious challenge was to defining and identifying adequate environment friendly consumers. Eco-friendly consumers are considered those consumers who prefer products that are not likely to endanger human health or damage the environment. [28] suggested three typical statements of green consumers as suggested are, first “identify myself as someone who is concerned with ‘green/environmental issues’”, second, “I purchase and consume green products”, and third, “I perceive my lifestyle as ‘green’”. To avoid possible bias, an online based group (GogreenGobeyond) was created on September 15, 2017 through Facebook and in two months period number of posts related to eco-friendly practices were uploaded. Members were also encouraged to participate in discussion through various competitions. Through this group primary subjects were identified and secondary subjects were identified reaching the initial group. At this stage, diversity among the samples was kept into consideration to ensure proper representation of the sample.

According to the guideline and suggestions, anything more than 300 samples would have been adequate for this particular study [18]. A total of 467 respondents were qualified for the final study. A number of parameters such as education, age, gender, occupation, household income, family size etc. may also affect recycling behavior. Although age does not play a trivial role in this case, few researches suggest that the younger generation is more aware and likely to behave more environment friendly. Keeping this in mind there are 58.67% of the samples in study represent very young age (within the age of 35). The questionnaire has four parts. At first, a brief introduction on recycling is given. The questionnaire starts with a brief on recycling and possible scopes of recycling to give overview on the topic and the specific purposes of the study. As recycling is relatively at its infant stage in Bangladesh, this seems to be quite useful. Necessary instructions were also included to complete the questionnaire properly. The second part of questionnaire contains demographics variables. Basic contact details, gender, age, education, monthly income and status of having children were taken as part of demography. The reason for taking these variables are primarily sample profiling and further contact. The third part contains ten screening questions. The respondents were asked to indicate whether they have engaged in these eco-friendly behavior/not and the reason for which they engaged in each green behavior (anchors ranged from 1 to 5, with “1 = no,” “2 = yes, because I have to,” “3 = yes, because it saves me money,” “4 = yes, because it is better for the environment,” “5 = yes, because everybody does it”). To be considered green consumers, respondents should engage in the majority (at least 50%) of set of eco-friendly behaviors for environmental reasons (“4 = yes, because it is better for the environment”). Ten screening questions were asked to determine the eligibility of the samples to be considered as qualified respondents. Last part of the questionnaire contains latent variables and observed variables to test the relationship among these variables.

IV. RESULTS AND IMPLICATIONS

Confirmatory factor analysis (CFA) was conducted to assess construct reliability, convergent validity, and discriminant validity in order to ensure reliability and effectiveness of the measurement model. The standardized factor loadings in Table 1 & 2 indicate that most factor loadings were > 0.50 (except few at the initial stage).
In the initial model Overall fit statistics (Table 2) of the measurement model are as follows: the model’s fit function (Chi-Square/ d.f.) is 2.641 which is lower than 3.0, GFI = 0.90, AGFI = 0.88, PGFI=0.58, CFI = 0.89, PNFI = 0.57, PCFI= 0.76, and RMSEA = 0.06. Reliability of the factors was calculated using Cronbach’s alpha. A Cronbach’s alpha value of greater than or equal to 0.7 is considered acceptable for the factor to be reliable [18]. The overall Cronbach’s alpha was 0.847 and that suggests overall fit and scores of every construct have shown consistency except in one; Perceived Behavioral Control (0.612). The initial factor analysis suggests number of areas concerning discriminant and convergent validity issues that was needed to work on. Out of 24 items, four items were dropped to improve the validity and reliability. The minimum threshold score of factor loading was 0.40. Items PBC2_R and PBC5_R were dropped due to low factor improved significantly. Composite Reliability (CR) score of all latent variables meet the requirement of 0.70 and Average Variance Extracted (AVE) scores of all the latent variables is greater than 0.50 except attitude and perceived behavioral control (Table 3), which is acceptable.

After making necessary adjustments from the initial model overall fit statistics of the measurement model has improved significantly in almost each area as follows (Appendix 3): the model’s fit function (Chi-Square/ d.f.) is 2.762 which is lower than 3.0, GFI = 0.92, AGFI = 0.91, PGFI=0.52, CFI = 0.92, PNFI = 0.51, PCFI= 0.75, and RMSEA = 0.058. All the indicators had significant loadings onto the respective latent constructs (p <0.001) with values greater than 0.40. In addition, the AVE for each construct is greater than 0.50, which further supports the convergent validity of the constructs.

Discriminant validity was assessed (Table 4) by comparing the AVE with the corresponding inter construct squared correlation estimates [16]. Thus, the measurement model has adequate reliability and construct validity.

Table 5 summarizes the results of the estimations of the main effects. First part of the hypothesis test, examined the direct association between three latent variables (ATT, SN and PBC) and one predictive variable (INT). The standardized regression coefficients and t-statistics for each independent variable shown in model reveals that among the components of TPB model tested in this study, Attitude and Perceived Behavioral Control isn’t statistically significant at 95% confidence level, however, they are significant at 90% confidence level (p= 0.064 and 0.063 respectively). On the other hand, Subjective Norms isn’t statically significant at all predicting recycling intention. This poses quite an
interesting observation at this stage. The analysis reveals that although an individual has strong social influences toward recycling (Mean=5.16), however, this does not necessarily be converted into one’s recycling intent. In the last hypothesis (H4), recycling intention was tested to predict actual recycling behavior (ARB) and this result is significant considering standardized regression coefficients, t-statistics and corresponding p-value.

**TABLE 5: Testing Results Of The Main Effects And Moderating Effects Of Consumers’ Recycling Behavior**

| Hypotheses | Path         | Standardized β | t-statistics |
|------------|--------------|----------------|--------------|
| Hypothesis 1 | ATT -> INT   | 0.094          | 1.875        |
| Hypothesis 2 | SN -> INT    | 0.068          | 1.468        |
| Hypothesis 3 | PBC -> INT   | 0.088          | 1.835        |
| Hypothesis 4 | INT -> ARB   | 0.188          | 2.284**      |

**P<0.01**

V. CONCLUSION

This study aims to assess the usefulness and application of one of the most widely used and influential models of the attitude–behavior relationship during the last 20 years in the context of recycling behavior specifies three conceptually independent determinants of intention. One is a personal factor termed attitude towards the behavior and refers to the degree to which a person has a favorable or unfavorable evaluation of the behavior in question. The second predictor is a social factor, social norm, which refers to the perceived social pressure to perform or not perform the behavior. The third one is Perceived Behavioral Control (PBC) that is defined as ‘the person’s belief as to how easy or difficult performance of the behavior is likely to be’ [1]. Attitudes, Subjective norms and Perceived Behavioral Control are each weighted for their relative importance and assumed to determine behavioral intention together. Although the model suggested a pervasive approach predicting consumer behavior through intention, too much of generalization of it may not be seem useful specially explaining pro-environmental behavior e.g. recycling. In various studies it shows that 30-40% people have shown positive intent towards pro-environmental behavior but only 5% of them are actually behaving in line with their commitment. These potential gaps have been termed as “Attitude-Behavior”, “Intention-Behavior” or “Value-Action” gap The findings and output of this research can be used in various industries as part of promoting recycling behavior as their marketing tool. As the point of differentiation among the competitors is narrowing day by day, this can be a strong weapon to differentiate their products and services. They can launch various recycling campaigns by educating consumers and that can be part of their Corporate Social Initiative as well. Government and other key policy makers can also take this as an input and will contribute into their policy making and developing strategic plan. As safeguarding environment is also vitally important agenda of key stakeholders of the Government, this can a strategic input in their future plan as well.

The findings from this study have several implications for the development and implementation of recycling schemes and for the communication campaigns which advocate the use of these schemes. The research would benefit many researchers as further study. The specific attitudes that correlated the most strongly with recycling behavior were: recycling is a good practice (ATT1) and recycling is useful (ATT2). Thus, campaigns which aim to reinforce the positive attitudes of recyclers and change the negative attitudes of non-recyclers should focus on these aspects of recycling behavior [15]. Perhaps by taking the ‘good citizen approach’ that recycling is a responsible and sensible way of preserving the environment and maintaining a good place to live, but at the same time emphasizing a ‘feel good factor’ in that participation in recycling schemes will be personally rewarding, will ensure greater participation levels.

This study also has great implication in future research too. One is methodological contributions through this research that may assist the future researchers to identify appropriate sample using the same technique applied here as this is probably one of the challenges to conduct research in this domain. The sampling technique used here, snowball sampling, seems very appropriate considering the lack of proper research infrastructure and culture we have in many countries and cultural settings. Future research can be conducted further studying the habit formation process in the context of recycling. As this study is mainly quantitative in nature, more in-depth qualitative study can be conducted to understand various areas more in detail.

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