Analyzing The Intention-Behaviour Gap on the use of Recycling Delivery Packaging

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Abstract

Drawing on the Theory of Planned Behaviour (TPB) and the Norm Activation Model (NAM), this study examines the gap between consumer intention and behaviour, in the context of product delivery packaging recyclability, through the factors that affect it. Using a mixed-method, sequential-explanatory approach, survey data was analyzed through Jamovi, while insights from the interviews were derived via thematic analysis. This study found that awareness of consequences is a factor that affects personal norms. Additionally, personal norms mediate the relationship between awareness of consequences and recycling intention. Furthermore, perceived behavioural control significantly affects how intention influences behaviour. This research can contribute to creating evidence-based recycling initiatives and solutions for the government and e-commerce to stimulate consumer recycling behaviour and alleviate the environmental impact of post-product delivery packaging waste.

Keywords: Theory of Planned Behaviour, Norm Activation Model, recycling intention, recycling behaviour, product delivery packaging

Introduction

Electronic commerce (E-commerce) is the process of selling and purchasing products on the internet through the use of online platforms and mobile applications (Rouse, 2019). E-commerce has quickly become an integral tool for the Philippines, as it has opened up opportunities for economic development while expanding the Filipinos' ways of shopping. With the COVID-19 pandemic limiting traditional transactions, Filipinos may have turned their backs against brick-and-mortar stores and instead opt to purchase online. However, along with Filipino consumers

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shifting to online shopping for convenience, are several environmental costs, such as concerns about packaging waste.

In the local context, the growing popularity of e-commerce platforms has worsened the country's plastic problem. Studies infer that every Filipino contributes 12.4 kilograms of plastic waste annually, which is left to decompose for decades in landfills. This problem has long been an environmental concern for the Philippines but was only magnified during the lockdowns as plastic packaging waste is claimed to increase by 300% in the country (Dela Peña, 2021).

Despite the hefty costs that come with purchasing various layers of packaging materials, e-commerce companies still opt to continue this method of encasing goods (Borocz, 2009). Cheng and Cao (2017) explained two reasons behind this rationale. First, this guarantees that products remain intact during shipment; secondly, there are no industry standard practices. Customers perceive that when more packaging materials are wrapped around the parcel, the safer the express, so excess packaging remains challenging to resist (Cheng & Cao, 2017). While these materials are essential to protect the item nestled inside, there is a significant environmental toll on the Philippines. Reports indicate that Filipinos dispose of more than 200 million pieces of single-use plastic waste daily (Romero, 2019). According to Cao and Liu (2019), even though consumers are environmentally conscious, their intention and participation in recycling express delivery packaging are not firm. This research, therefore, aims to analyze the factors that motivate and hinder consumers in recycling product delivery packaging waste by answering the overarching research question:

What key factors influence recycling intention and behaviour towards product delivery packaging?

Significance of the Study

The significance of the study stems from its goal of developing evidence-based suggestions to encourage consumer recycling behaviour toward product delivery packaging. This tackles the 12th Sustainable Development Goal (SDG) adopted by the United Nations, which is responsible consumption and production. The findings can also be used as a tool to help e-commerce platforms improve their product delivery packaging and waste recycling activities, which is aligned with the 17th SDG – partnership for the goals. Apart from this, the results from the study are scalable and

can be helpful to the Philippine government in promoting recycling behaviour and piloting recycling initiatives across the country.

The study's main limitation is that it analyzed the recycling intention and behaviour of respondents from Generations Y and Z, excluding those belonging to Generation X, thereby limiting the study's generalizability to only the aforementioned generations. Moreover, this study is limited to participants who purchase from e-commerce at least once a month.

Literature Review

Recycling Intention

The intention to engage in recycling emanates from an individual's responsibility to the environment and serves as a personal response to combat the harmful effects of climate change (Yu, Lin, Kao, Chao, & Yu, 2019). Literature has identified recycling intention as a consumer's commitment to participate in recycling behaviours. Intention refers to a person's self-made instructions to achieve an end goal (Sheeran & Webb, 2016). The explanation of this term was specifically derived from exploring different variables and models within the realm of social psychology, including the widely-used Theory of Planned Behaviour by Ajzen (1991). Every individual's intention to recycle involves analysis to derive good behaviours. Evidence suggests that intentions are based on feelings about performing a particular behaviour (Conner, McEachan, Lawton, & Gardner, 2016). Additionally, Sheeran and Webb (2016) suggest that intention is guided by several factors influencing actions and behaviours. The formation of intentions encourages psychological processes that drive the realization of said intentions, however, these processes do not fully guarantee enactment.

Recycling Behaviour

Recycling behaviour is the ideal outcome of an individual's intent to recycle. In comparison to intention, behaviour also refers to self-made instructions, but is headed towards attaining the goal by devoting to commit (Levy, Orion, & Leshem, 2018). Behavioural predictions are based on an individual's thoughts about the future consequences of taking action. Empirical studies show that intentions are a reliable indicator of well-defined behaviour (Husin & Rahman, 2013). Individuals who recycle the packaging from delivery parcels exhibit recycling behaviour. This constitutes

segregating and organizing waste, participating in recycling programmes and initiatives, collecting recyclable waste for resale or donating to recyclers, and partaking in drop-off recycling activities. Consumers are driven by their social responsibility to conserve the environment, influencing them to act upon their recycling, which also affects pro-environmental behaviours (Guerin, Crete, & Mercier, 2001).

Intention-Behaviour Gap

The intention-behaviour gap is characterized by failing to translate intentions into action or behaviour-change (Faries, 2016). Sheeran and Webb (2016) declare that numerous correlational studies have found that intentions predict behaviour. These findings suggest that intention provides a superior prediction of behaviour compared to other factors such as attitudes, norms, self-efficacy, and perceptions of risk and severity. However, while these studies posit that forming an intention is crucial in initiating new behaviours, this is not necessarily the case when adopting green behaviours. Some findings reveal that consumers with positive attitudes and intentions toward pro-environmental behaviour do not transform into actualized behaviour (ElHaffar, Durif & Dube, 2020).

Theoretical Frameworks and Hypotheses Development
Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) is a widely used theory that explains the link between one's beliefs and behaviour. Ajzen (1991) theorized that three factors influence one's behavioural intentions: attitudes, subjective norms, and perceived behavioural control.

Recycling Attitude. Ajzen (1991, p.188) defines attitude as "the degree to which a person has a favourable or unfavourable evaluation or appraisal of the behaviour in question." According to Blue (1995), attitude toward a behaviour is hinged on a cognitive belief structure driven by two subcomponents: (1) salient beliefs that when carried out will lead to a specific outcome, and (2) the evaluation of that particular outcome.

Subjective Norms. Subjective norms is a social factor that refers to the belief about whether people will approve or disapprove of a particular behaviour (Ajzen, 1991). In other words, this factor considers the evaluation of relevant others on whether one should or should not perform the behaviour.

Perceived Behavioural Control. Perceived behavioural control (PBC) refers to the perceived ease or difficulty of performing and accomplishing a particular behaviour that considers one's past experiences.

Norm Activation Model

The Norm Activation Model (NAM) is a model constructed by Shahlom Schwartz in the context of altruistic and pro-environmental behaviour and intention (Onwezen et al., 2013). With personal norms ascribed as the core of its model, it is activated by two factors: the awareness of the consequences of manifesting or not manifesting a particular behaviour and the feeling of responsibility for performing a particular behaviour (Onwezen, Antonides, & Bartels, 2013). NAM postulates that altruistic behaviour derives from the moral obligation to prevent damage to something valued (Landon, Woosnam, & Boley, 2018).

Awareness of Consequences. One crucial factor that influences the initial activation of personal norms is awareness of consequences. In other words, the NAM suggests that this is one of the critical factors that activates one's personal obligation to altruistic behaviour (Park & Ha, 2014). According to Fang, Chiang, Ng, and Lo (2019), awareness of consequences pertains to the individual's consciousness of the gravity of their behaviour towards another's wellbeing.

Ascription of Responsibility. Ascription of responsibility is another crucial factor that activates the personal obligation of an individual to an altruistic behaviour or personal norm. It is when an individual personally feels responsible for the consequences of their actions or behaviour (Fang et al., 2019).

Personal Norms. Personal norms pertains to one's self-concept of consciously feeling morally obligated to exhibit a particular behaviour. It can be considered a type of self-discipline linked to pro-environmental behaviours. Hence, the moral obligation aspect found in one's personal norms can motivate an individual to manifest pro-environmental behaviours (Fang et al., 2019).

Norm Activation Model and Theory of Planned Behaviour

There have been studies that have merged the NAM with the TPB in evaluating pro-environmental behaviour. Previous studies that integrated the two theories discovered that personal norms determine one's behaviour which is mediated by intention (Onwezen et al., 2013). According to Park and Ha (2014), combinations of theories have been effectively and successfully applied in

studies discussing pro-environmental behaviour. However, little to no research uses these theories in the context of the Philippines and in relation to product delivery packaging. Thus, this study constructed a conceptual framework merging NAM and TPB to analyze Filipinos' recycling intention and behaviour. It addresses the drawbacks of using a single theory to explain one's intention and is more suitable for analyzing such pro-environmental behaviour. Incorporating the two theories would present a more in-depth understanding of pro-environmental intentions and behaviour towards delivery packaging. Unlike many other studies that focused solely on analyzing intention, this study also extensively analyzed human behaviour and examined the intention–behaviour gap in recycling delivery packaging.

Conceptual Framework and Summary of Hypotheses

Figure 1: A Conceptual Framework Integrating the Norm Activation Model with the Theory of Planned Behaviour
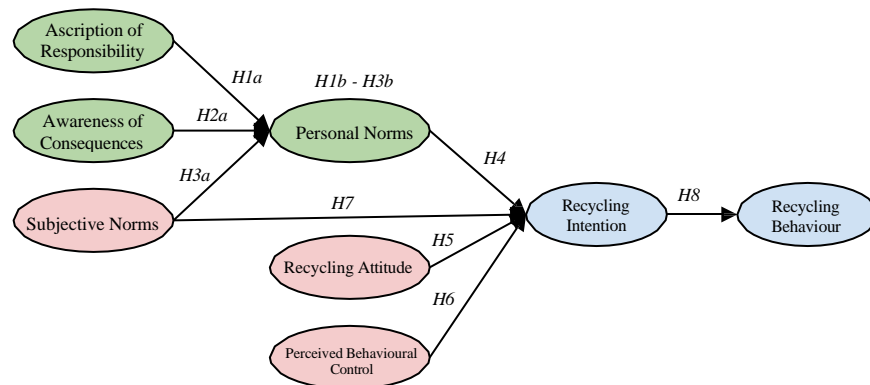
Source: Authors' own

H1a to H3a. Ascription of responsibility, awareness of consequence, and subjective norms positively affect personal norms.

H1b to H3b. The relationship between ascription of responsibility, awareness of consequence, and subjective norms toward recycling intention is mediated by personal norms.

H4 to H7. Personal norms, recycling attitude, perceived behavioural control, and subjective norms positively affect an individual's willingness to recycle delivery packaging.

H8. Recycling intention is related to actual recycling behaviour. By extension, the relationship between recycling attitude, subjective norms, and perceived behavioural control towards recycling behaviour is mediated by recycling intention.

Methodology

In order to examine the factors that influence the gap between an individual's recycling intention and behaviour towards delivery packaging, the researchers employed the mixed-method approach of Creswell's (2006) sequential-explanatory design. The study followed a survey research design with follow-up, qualitative, in-depth interviews.

This study required two phases of data collection to identify the gap between behaviour and intent. The first phase focused on consumer intention toward recycling product delivery packaging. After a month, the second phase was rolled out which focused on consumer behaviour. Following the mixed-method sequential-explanatory approach, both rounds of data collection included the same participants (Creswell, 2006).

Using the non-probability sampling technique of purposive sampling, the researchers administered an online survey, powered by Google Forms. The participants of the study are the primary source of data. The researchers targeted online shoppers residing in the Philippines. The target participants' age ranges from 18-35, since statistics show that they are the most active online shoppers (Masigan, 2020). The survey was measured through a Likert scale between 1 (strongly disagree) and 7 (strongly agree). In the same survey, qualitative questions were included to better understand the psyche of the respondents. To further examine the qualitative results of the study, the researchers conducted in-depth interviews via Zoom. Subsequent to the two phases, the interviews further explored the relationship between behaviour and intention.

The study utilized an a-priori sample size calculator, adopted from Soper (2017), to arrive at the minimum sample for the regression analysis. The following parameters were considered: (1) an anticipated effect size (f^2) of 0.15, (2) desired statistical level of 80%, (3) six predictors based on the research's conceptual framework, and (4) a significance level of 0.05. From this, the researchers arrived at a minimum sample of 97 for regression.

The researchers intended to provide a well-rounded analysis of the primary data gathered. To achieve this goal, they utilized the Jamovi project (2021) to run the data and conduct appropriate statistical analyses. Reliability was measured using Cronbach's Alpha. Correlation

analysis was illustrated through a matrix showing the relationship between the dependent and independent variables of the research. Regression analysis was also used to determine the functional relationships between the variables in the study (Chatterjee & Hadi, 2015). Furthermore, mediation analyses were also conducted to determine whether personal norms and recycling intention act as mediating variables. These analyses show the mechanism of the mediating variables toward the independent and dependent variables (Hayes & Preacher, 2013).

Moving onto the qualitative analysis of the mixed-method approach, the researchers conducted in-depth follow-up interviews. Grounded on the intent to analyze the potential intention-behaviour gap, the interviewees were filtered and selected from the same pool of survey respondents using certain selection criteria. The main criterion considered was the purchase frequency of the respondents. The researchers filtered the pool of respondents to those who purchased online at least once a month since the interviews were done a month succeeding the survey. This criterion was based on the study by Randall and Wolff (1994), where they explained that the "intention-behaviour relationships should be measured over a short period of delay" (p. 405). Thereafter, the participants were grouped according to their intention and behaviour. The categories are as follows: (1) high intention-high behaviour, (2) high intention-low behaviour, (3) low intention-high behaviour, and (4) low intention-low behaviour. Once the participants were grouped, two people were randomly selected to proceed with the interview. Moreover, the framework of the study helped structure the questions from the interview.

The researchers used thematic analysis to analyze the results from the in-depth follow-up interviews. According to Braun and Clarke (2012), thematic analysis "allows the researcher to see and make sense of collective or shared meanings and experiences" (p. 57). Repeating patterns were identified and organized to highlight what was shared among the given data set. The researchers generated codes for these repeated patterns, after which, such codes were grouped accordingly so that a general theme per group could be established.

Data Results and Analysis

Descriptive Analysis

The researchers gathered a total of 116 responses for the entirety of the study. Most of the respondents were females aged between 18 to 22 years old. Most of the respondents were students

with a monthly income of ₱2,001 to ₱10,000. Moreover, 30.2% of the respondents receive delivery packaging at least every other week.

Quantitative Analysis

Table 1:The Results of the Reliability Test of the Variables

Constructs/Indicators	Mean	Cronbach's Alpha
Ascription of responsibility	5.45	0.779
Awareness of consequences	6.26	0.958
Subjective norms	3.59	0.851
Recycling attitude	6.19	0.924
Personal norms	5.42	0.892
Perceived behavioural control	5.25	0.841
Recycling intention	5.09	0.950
Recycling behaviour	3.58	0.814

Source: Authors' own

A total of 98 responses were pooled to gather sufficient data after the first and second phases of the study. Respondents were filtered based on the selection criteria mentioned in the methodology. Reliability tests was conducted before running the statistical analyses. The results from the reliability analysis are illustrated in Table 1. Each construct resulted in a Cronbach's Alpha of at least 0.7, signifying that the data are reliable (Baldasaro, Shanahan, & Bauer, 2013).

Table 2: The Correlation Matrix of the Variables

		AR	AC	SN	RA	PN	PBC	RI	RB
AR	**Pearson's r**	—							
	p-value	—							
AC	**Pearson's r**	0.559***	—						
	p-value	< .001	—						
SN	**Pearson's r**	0.427***	0.234*	—					
	p-value	< .001	0.020	—					
RA	**Pearson's r**	0.550***	0.529***	0.336***	—				
	p-value	< .001	< .001	< .001	—				
PN	**Pearson's r**	0.704***	0.556***	0.566***	0.593***	—			
	p-value	< .001	< .001	< .001	< .001	—			

PBC	**Pearson's r**	0.448***	0.417***	0.585***	0.444***	0.699***	—	
	p-value	< .001	< .001	< .001	< .001	< .001	—	
RI	**Pearson's r**	0.474***	0.373***	0.518***	0.396***	0.752***	0.759***	—
	p-value	< .001	< .001	< .001	< .001	< .001	< .001	—
RB	**Pearson's r**	0.229*	**-0.001**	0.451***	**0.135**	0.357***	0.394***	0.376***	—
	p-value	0.023	0.992	< .001	0.185	< .001	< .001	< .001	—

Note. * p < .05, ** p < .01, *** p < .001

Legend: AR = Ascription of Responsibility; AC = Awareness of Consequence; SN = Subjective Norms; RA = Recycling Attitude; PN = Personal Norms; PBC = Perceived Behavioural Control; RI = Recycling Intention; RB = Recycling Behaviour

Source: Authors' own

The correlation between all the variables of the study was tested through Pearson's correlation. The data shows that all are statistically significant except for the correlation between recycling behaviour and awareness of consequences and between recycling behaviour and recycling attitude. Despite this, these factors will not be omitted since the computation for the regression analysis focuses on recycling intention and behaviour.

Assumption tests were conducted before the regression analysis. The results were in accordance with the standards of the normality tests, heteroskedasticity tests, and collinearity statistics.

Table 3: The Results from the Regression Analysis of Ascription of Responsibility, Awareness of Consequences, and Subjective Norms to Personal Norms

Model Fit Measures

				Overall Model Test			
Model	**R**	**R²**	**Adjusted R²**	**F**	**df1**	**df2**	**p**
1	0.788	0.620	0.608	51.2	3	94	< .001

Model Coefficients - Personal Norms

			95% Confidence Interval					95% Confidence Interval	
Predictor	**Estimate**	**SE**	**Lower**	**Upper**	**t**	**p**	**Stand. Estimate**	**Lower**	**Upper**
Intercept	0.646	0.4490	-0.2450	1.538	1.44	0.153			
AR	**0.409**	**0.0782**	**0.2541**	**0.565**	**5.23**	**< .001**	**0.431**	**0.2677**	**0.595**
AC	**0.255**	**0.0821**	**0.0924**	**0.419**	**3.11**	**0.002**	**0.238**	**0.0862**	**0.391**

SN	0.264	0.0569	0.1507	0.377	4.63	< .001	0.326	0.1861	0.465

Legend: AR = Ascription of Responsibility; AC = Awareness of Consequence; SN = Subjective Norms

Source: Authors' own

Table 3 shows the results from the regression analysis between the ascription of responsibility, awareness of consequences, and subjective norms to personal norms. Since the p-values of the independent variables are < 0.05, this yields a statistically significant result. The quantitative data reveals consistent results with previous studies, which indicate that the ascription of responsibility and subjective norms positively influence personal norms (Park & Ha, 2014).

Table 4: The Results from the Mediation Analysis of Personal Norms to Recycling Intention

Type	Effect	Estimate	SE	95% C.I. (a) Lower	Upper	β	Z	p
Indirect	AR ⇒ PN ⇒ RI	0.3977	0.0926	0.2162	0.5792	0.3287	4.295	< .001
	AC ⇒ PN ⇒ RI	0.2481	0.0854	0.0808	0.4154	0.1817	2.907	0.004
	SN ⇒ PN ⇒ RI	0.2561	0.0647	0.1292	0.3830	0.2481	3.956	< .001
Direct	AR ⇒ RI	-0.1318	0.1160	-0.3592	0.0956	-0.1089	-1.136	0.256
	AC ⇒ RI	-0.0298	0.1126	-0.2505	0.1909	-0.0218	-0.265	0.791
	SN ⇒ RI	0.1432	0.0823	-0.0182	0.3045	0.1387	1.739	0.082
Total	AR ⇒ RI	0.2659	0.1270	0.0170	0.5148	0.2198	2.094	0.036
	AC ⇒ RI	0.2183	0.1333	-0.0430	0.4797	0.1599	1.637	0.102
	SN ⇒ RI	0.3993	0.0924	0.2182	0.5804	0.3868	4.321	< .001

Legend: AR = Ascription of Responsibility; AC = Awareness of Consequence; SN = Subjective Norms; PN = Personal Norms; RI = Recycling Intention

Note. Confidence intervals computed with method: Standard (Delta method); Betas are completely standardized effect sizes

Source: Authors' own

Table 4 shows the mediation analysis for the indirect relationship between the ascription of responsibility, awareness of consequences, and subjective norms with personal norms. The three aforementioned factors serve as mediators with a p-value of < 0.001 for the ascription of responsibility, 0.004 for awareness of consequences, and < 0.001 for subjective norms. The table also shows that its possible range of effects is an increase of 0.2162 and 0.5792 for the ascription of responsibility, 0.0808 and 0.4154 for awareness of consequences, and 0.1292 and 0.3830 for subjective norms, per unit of personal norms, which are all based on the upper and lower confidence intervals. According to Table 4, the lower limits of the confidence intervals are near or

below 0.00, indicating that the three factors have marginal statistical significance. This suggests that these three variables can affect recycling intention.

Table 5: The Results from the Regression Analysis of Personal Norms, Recycling Attitude, Perceived Behavioural Control, and Subjective Norms to Recycling Intention

Model Fit Measures

				Overall Model Test			
Model	**R**	**R²**	**Adjusted R²**	**F**	**df1**	**df2**	**p**
1	0.823	0.677	0.663	48.8	4	93	< .001

Model Coefficients - Recycling Intention

			95% Confidence Interval					95% Confidence Interval	
Predictor	**Estimate**	**SE**	**Lower**	**Upper**	**T**	**p**	**Stand. Estimate**	**Lower**	**Upper**
Intercept	0.06478	0.7002	-1.326	1.4552	0.0925	0.926			
PN	**0.61643**	**0.1209**	**0.376**	**0.8565**	**5.1001**	**< .001**	**0.48359**	**0.295**	**0.6719**
RA	-0.18297	0.1384	-0.458	0.0919	-1.3220	0.189	-0.09682	-0.242	0.0486
PBC	**0.53024**	**0.1009**	**0.330**	**0.7306**	**5.2546**	**< .001**	**0.45794**	**0.285**	**0.6310**
SN	0.00956	0.0779	-0.145	0.1642	0.1227	0.903	0.00926	-0.141	0.1591

Legend: SN = Subjective Norms; RA= Recycling Attitude; PN = Personal Norms; PBC = Perceived Behavioural Control

Source: Authors' own

The results from the regression analysis between personal norms, recycling attitude, perceived behavioural control, and subjective norms to recycling intention are shown in Table 5. It can be noted that the regression analysis has found only two factors (personal norms and perceived behavioural control) to be statistically significant, yielding a p-value of < 0.001. As for the results from recycling attitude and subjective norms, they amounted to 0.189 and 0.903, respectively. The quantitative data suggests that subjective norms and recycling attitudes are statistically insignificant. This is because their p-values amounted to more than 0.05.

Table 6: The Results from the Regression Analysis of Recycling Intention to Recycling Behaviour

Model Fit Measures

| Model | R | R² | Adjusted R² | Overall Model Test | | | |
				F	df1	df2	p
1	0.376	0.141	0.133	15.8	1	96	< .001

Model Coefficients - Recycling Behaviour

| Predictor | Estimate | SE | 95% Confidence Interval | | T | p | Stand. Estimate | 95% Confidence Interval | |
			Lower	Upper				Lower	Upper
Intercept	1.467	0.554	0.367	2.566	2.65	0.009			
RI	**0.415**	**0.104**	**0.208**	**0.623**	**3.98**	**< .001**	**0.376**	**0.188**	**0.564**

Legend: RI = Recycling Intention

Source: Authors' own

Regression analysis was also utilized to test the relationship between the participants' recycling intention and behaviour. Results reveal that recycling intention affects recycling behaviour as its p-value amounted to < 0.001 (See Table 6), indicating that it is statistically significant. A study by Strydom (2018) also found the influence of intention on behaviour. However, based on the r^2, it can be seen that recycling intention has a low explanatory power on recycling behaviour.

Table 7: The Results from the Mediation Analysis of Recycling Intention with Recycling Behaviour

| Type | Effect | Estimate | SE | 95% C.I. (a) | | β | z | p |
				Lower	Upper			
Indirect	PN ⇒ RI ⇒ RB	0.0773	0.0986	-0.1160	0.271	0.0549	0.784	0.433
	PBC ⇒ RI ⇒ RB	0.0740	0.0942	-0.1107	0.259	0.0578	0.785	0.433
Direct	PN ⇒ RB	0.1466	0.2054	-0.2561	0.549	0.1041	0.713	0.476
	PBC ⇒ RB	0.2882	0.1889	-0.0821	0.658	0.2254	1.526	0.127
Total	PN ⇒ RB	0.2239	0.1823	-0.1334	0.581	0.1591	1.228	0.219
	PBC ⇒ RB	0.3621	0.1656	0.0375	0.687	0.2832	2.187	0.029

Legend: PN = Personal Norms; PBC = Perceived Behavioural Control; RI = Recycling Intention; RB = Recycling Behaviour

Note. Confidence intervals computed with method: Standard (Delta method); Betas are completely standardized effect sizes

Source: Authors' own

Based on the regression analysis in Table 5, only two factors were found to be statistically significant. Specifically, these were: (1) personal norms and (2) perceived behavioural control. As

such, the mediation analysis utilized only these two factors with recycling intention as the mediator to recycling behaviour. The results from the regression analysis in Table 6 and the mediation analysis in Table 7 suggest variability. Table 6 indicates a significant relationship between intention and behaviour. However, Table 7 reveals that intention does not mediate the relationship between personal norms and perceived behavioural control toward recycling behaviour.

Qualitative Analysis

The researchers analyzed the qualitative data gathered from the survey questionnaires to support the quantitative results and better understand its erratic patterns. Evidence shows that 90% (88/98) of the respondents intended to recycle. The most salient reasons for this intention include reducing their carbon footprint, reducing waste, and helping the environment. After a month, 66% (65/98) reported that they were able to actualize their intention into behaviour.

However, there is a caveat. Diving deeper into the responses, the researchers found that out of the 65 who recycled, 83% (54/65) cited that they recycled by reusing, while only 12% (8/65) actually recycled, with recycling drives as their primary means. Similar results were revealed in Strydom's study (2018), which found that "respondents show a higher probability that they intend to recycle than their self-reported behaviour suggests" (p. 14). Meanwhile, 34% (33/98) of the respondents who did not recycle declared difficulty and the lack of know-how as their main barriers to recycling.

To better understand the factors that contribute to the intention-behaviour gap, a thematic analysis was conducted as shown in Table 8.

Table 8: The Results from the Thematic Analysis

	Awareness		Perceived Behavioural Control	
	Awareness of consequences (29)	**Conflation of recycling & reusing (7)**	**Perceived degree of convenience (17)**	**Not knowing the specifics of the recycling process (8)**
High Intention, High Behaviour	I feel like the effects of delivery packaging is that it harms the environment and that causes me to actually recycle and be part of the recycling process. So with that being said, I wanna mitigate or minimize my effects on climate change.		Personally, I find it so much more convenient to donate to organizations such as The Plaf because they actually have a drop-off point in my village. So for me, it's convenient to donate and I also see it in malls wherein they accept donations for plastic wastes.	
Low Intention, Low Behaviour	Usually I just throw the plastic packaging away but sometimes I get guilty that there's so much plastic waste. For example, there are times that I receive so much bubble wrap for such a small item.		For me, it's really just hard to recycle. If I'm able to store my plastic of one week's worth and someone collects it once a week, that would help declutter the waste we have at home. Having someone collect the plastic waste once a week will be very convenient. I think that storing plastic waste will be very simple but having those recycling drives to collect and recycle it will be helpful.	I really don't know how to recycle. If there could be some information that could teach me how to recycle small pieces of plastic, then that would be great. But right now, I cannot think of anything I could do with the plastic I get. Aside from that, the main barrier to the existing recycling drives is the ease of access. For example, right now, I do not know any. If I knew about it, I would take advantage of it.

Low Intention, High Behaviour	Delivery packaging clogs the drainage. It harms the Earth because it's not biodegradable.		I'm actually more encouraged now that I realized it's fairly easy to do.	I think people don't recycle because sometimes because it's hard to do. For example, Zesto packs, you see it from the internet they turn it into bags–it's not that easy to do. So yeah it's hard to do alone especially at home.
High Intention, Low Behaviour	As someone who purchases a lot, I think it's really bad. From me alone, the amount of packaging is already a lot, so just imagine an entire street with the same amount. So it's really bad nowadays, especially with e-commerce.	Recycling is reusing. For me, recycling is just using a material again.	I think that recycling is not easy at all. Altering something to make a new purpose out of it is definitely not easy. I am not creative enough to do it. And in general, I felt like I didn't want to do it as well because reusing is way easier. So yeah, I think that's a barrier for me when it comes to recycling.	I think [I need to be] more informed of the other ways I can recycle – what I can do since I'm not really aware of how to recycle packages.

Category 1: High Intention, High Behaviour

The respondents under this category are characterized by their high recycling intention and their ability to actualize it. The themes in this category are (1) personal norms, chiefly preceded by awareness of consequences, and (2) perceived behavioural control, particularly the perceived degree of convenience. The interviews showed that personal norms is a notable factor that influenced recycling intention and behaviour. It was also revealed that individuals under this category feel morally obligated to recycle. This moral obligation was found to stem from their values and awareness of consequences. Accordingly, this finding aligns with previous studies which claimed that personal norms is a significant factor that induces recycling intention and behaviour (de Groot, Bondy, & Schuitema, 2021).

> The news that I see about our planet Earth. I think that's really the main source of why I recycle… I was influenced to recycle because I became aware and I feel like awareness is really the biggest impact for people to change their ways.   — Interviewee #2

The thematic analysis strengthened the importance of awareness of consequences as a major precedent of personal norms and a predictor of recycling intention. Given that awareness of consequences has a statistically significant relationship with personal norms (p = 0.002), wherein the latter serves as a mediator between awareness of consequences and intention (p = 0.004), this results in a potentially higher intent to recycle. The study by Park and Ha (2014) echoes this, stating that the awareness of consequences precedes personal norms and consequently allows for a stronger intention to recycle. However, what is worth noting here is that personal norms are a reason that brought forth the interviewees' environmental advocacies, wherein these advocacies are mobilized by actively encouraging others to recycle.

> Promoting recycling is one of my advocacies and I share about it with my organizations. So it's spreading awareness, campaigns, and publicity materials on Facebook.
> — Interviewee #1

Given its strong influence on recycling intention, the researchers further explored how these personal norms came to be. According to the interviewees, the education they received and

the habits they were exposed to during their formative years played a big part in establishing their personal norms, which in turn affected their environmental consciousness, intention, and recycling practices. Since it was ingrained in them through the years, they became more accustomed to it, eventually helping them normalize recycling behaviour. This is consistent with the 2020 study by Hoffmann and Muttarak that declares that in the Philippines, formal schooling has a direct influence on producing pro-environmental behaviour by developing the knowledge, awareness, and skills that are relevant to mitigating environmental problems (Hoffmann & Muttarak, 2020).

> Through the teachings back in high school, it's easier to segregate as early as you can or doing the first steps. We've been practicing recycling or segregation so I've ingrained that into my everyday lifestyle that we can always do our part.   — Interviewee #1

Meanwhile, the second main factor determining the respondents' recycling intention and behaviour in Category 1 is perceived behavioural control. In a way, the education they received can potentially explain their perceived convenience towards recycling. As mentioned before, recycling behaviour was encouraged and facilitated by education. Apart from this, accessible recycling facilities and initiatives in their respective communities further encouraged them to recycle. For that reason, recycling is perceived to be effortless. Although, it is interesting to note that despite their high intention and high behaviour, one of the interviewees signified that convenience still plays a role in actualizing recycling behaviour.

Category 2: Low Intention, Low Behaviour

Across all categories, it can be seen that individuals are mindful of the harmful effects of plastic waste on the environment. However, for the participants who fall under this second category, it seems that the awareness of consequences is inadequate in sparking recycling intention and behaviour. One possible reason for this is anchored on the perceived degree of convenience of recycling and not knowing the specifics of this process. Based on the thematic analysis, it is evident that although they know the difference between recycling and reusing, they are not quite familiar with the specific steps for recycling. Additionally, the interviewees also mentioned that for them, recycling is difficult since they would have to go out of their way to do it. When the interviewees

were introduced to the idea of recycling drives, they still found it a hassle to collect and donate their plastic waste.

> For me it's hard to recycle (plastic packaging). It's a hassle for me to do, especially on my own. Don't get me wrong, but I'd have to exert extra effort versus reusing. Also, since recycling is a hard process, I don't think I'm actually capable of really recycling packaging.
>
> — Interviewee #8

Category 2 primarily illustrates the hindrances to recycling delivery packaging. It is evident, based on the qualitative data, that the participants are unaware of recycling properly. That is, they are aware of the main concept behind recycling; however, they lack the knowledge to perform this action. This reflects one of the themes from the thematic analysis, wherein participants do not know the specifics of recycling, noting its seemingly complex process. Similarly, the findings from van der Vegt, Velzing, Rietbergen, and Hunt (2022) show that a primary barrier to recycling is the lack of knowledge, information, and education. The lack of knowledge spans several aspects as it includes the participants' familiarity with recycling, how to properly dispose of products and packaging, its benefits, consequences, and the like (van der Vegt et al., 2022).

Comparing recycling to reusing or reducing waste, the respondents perceive recycling as difficult to do. This also reflects another theme in the thematic analysis, which is the individuals' perceived degree of convenience. This perceived degree of convenience has been found to be a perceived cost of pro-environmental behaviour (Steg, Bolderdijk, Keizer, & Perlaviciute, 2014), who reveal that individuals "cease to engage in pro-environmental behaviours when doing so is more effortful, inconvenient, and financially unattractive" (p. 111). The same authors also pointed out that individuals may "engage in easy pro-environmental actions or express good intentions, but fail to engage in more costly pro-environmental actions that are needed to substantially increase environmental quality" (Steg et al., 2014, p. 111).

Category 3: Low Intention, High Behaviour

Individuals who recycled despite their relatively low recycling intention, constitute this category. Respondents from this category can be classified as recycling enablers since these individuals

could fulfill recycling practices even though there was no intention to do so initially. Upon diving deeper into the responses, the initial hesitation in recycling was revealed to come from the apprehension towards COVID-19, specifically the undesirable effect of virus contamination on parcels. Delivery packaging comes in layers of wrappers and plastics, depending on the fragility of the content. Interviewees from this category substantiated that the contamination of the outermost packaging layer deters recycling exercises. This perception is coherent with Benson, Bassey, and Palanisamy (2021), with outcomes pointing toward the widespread deterioration of waste disposal systems brought by hygiene concerns of the COVID-19 pandemic. However, the Phase 2 survey results show that the significant amount of plastic used in product delivery packaging counters their initial hindrance to recycling.

> The outer portion is exposed to a lot of people. But the packaging inside, where it was packed, it's only exposed to the manufacturers or the sellers, so we feel safer when keeping it.
>
> — Interviewee #5

It is intriguing to see the explanations unravel on how respondents from this category were able to recycle despite the low intention. The findings reveal that their high awareness of consequences outweighed COVID-19 worry. Additionally, Category 3 respondents emphasized the impact of the standardized degree of convenience in recycling. Regardless of virus transmission distress, respondents demonstrated high recycling behaviour due to the perceived ease of engaging in recycling drives. One of the respondents explained that upon arrival of her parcel, she saw that the packaging was easily recyclable and looked presentable. External influence contributed to the high behaviour demonstrated, also referred to as external support. Recycling drives are external enablers of recycling as they ease participation in recycling despite not intending to. As phrased in one of the survey responses from Phase 2, individuals managed to recycle once they received the packages as they discovered how simple it was to retain the packaging for recycling drive collections. From the analysis of Category 3 survey responses and interview clarifications, it can be inferred that individuals recycled despite not intending to do so because of their general understanding of environmental issues, and also because the revelation that it is a subcategory of external support overshadowed their apprehensions regarding the COVID-19 virus.

It's more of the convenience to do it. My parents and I would just collect the plastic and donate them to an organization.   – Interviewee #6

*Category 4: High Intention, Low Behaviour*

This category's presence points to the occurrence of the intention-behaviour gap. Respondents who signified their intent to recycle but fell short in actualizing it fall under this category. The findings suggest that while the respondents were aware of (1) the consequences of packaging waste and (2) the benefits of recycling; this did not necessarily equate to knowledge of the specifics of recycling. The thematic analysis shows that perceived inconvenience and lack of knowledge of the recycling process were cited as barriers in the translation to recycling behaviour. The interviews revealed that (1) only a few knew how to recycle, (2) most were unaware of the presence of recycling drives, and (3) respondents perceived recycling as difficult to execute. It is interesting to note that despite these barriers, respondents still signified their recycling intent. Thus, this engenders questions on (1) the reliability of intention as a predictor of behaviour and (2) the driving force behind people's intention to recycle despite not knowing how. Self-desirability bias and the conflation of recycling and reusing offer potential explanations for these questions.

The results signal conflation of recycling and reusing. 83% signified that they were recycling but were later found to be reusing. The thematic analysis ascertained that this conflation recurred seven times throughout the interviews. These findings coincide with Parkinson and Thompson (2003), who state that frequently, there is confusion between these two terminologies stemming from the synonymous use of recycling and reusing. Moreover, arbitrary descriptions of these terminologies also contribute to the conflation (Ali, 2013). Conflation may have led to a misperception of one's behavioural control. And grounded on the interviews, it might be inferred that the perceived ease of reusing over recycling may have caused an overrepresentation of recycling intention, contributing to the intention-behaviour gap.

In general, I felt like I didn't want to recycle because reusing is way easier. So I think that's a barrier for me when it comes to recycling.   — Interviewee #4

Apart from this, self-desirability bias might have factored into the gap. Self-desirability bias refers to the "tendency of research subjects to choose responses they believe are more socially desirable or acceptable rather than responses that are reflective of their true thoughts or feelings" (Grimm, 2010). Consequently, this leads to an overstatement of socially desirable responses and an underreporting of responses thought to be undesirable (Grimm, 2010). Therefore, in the context of this study, several respondents might have perceived intending to recycle as socially desirable given their awareness of the benefits of recycling and the adverse environmental effects of waste. Accordingly, respondents might have been inclined to overreport their intention to recycle, despite their lack of knowledge. Hence, these findings impede the usability of intention as a determinant of behaviour while advancing the relevance of perceived behavioural control. This idea is congruent with the low r-squared shown in Table 9, which indicates the low explanatory power of intention towards behaviour. To further assess this, the researchers conducted a follow-up analysis on perceived behavioural control, given its salience.

Figure 2: Estimated Marginal Means (Recycling Intention * Perceived Behavioural Control)
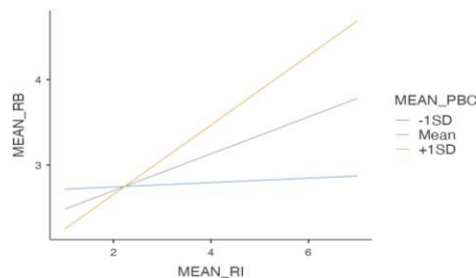
Source: Author's own

Using the estimated marginal means of perceived behavioural control, recycling intention, and recycling behaviour, Figure 2 shows an intersection between the three variables. The intersection indicates an interaction between the variables, suggesting that perceived behavioural control is the moderating variable of recycling intention and behaviour. As the value of perceived behavioural control increases, so does the effect of recycling intention on recycling behaviour. Therefore, the estimated marginal means reveal that perceived behavioural control acts as the moderating variable in the equation. Parallel to this finding is (1) the theory of Ajzen (1991) declaring that perceived behavioural control moderates the relationship between recycling

intention and recycling behaviour; and (2) Strydom's (2018) study finding perceived behavioural control to have the largest effect on recycling behaviour.

Table 9: Conclusions

Research Question	Summary of Findings and Conclusion
What key factors influence recycling intention and behaviour towards product delivery packaging?	Across all categories, perceived behavioural control significantly affects the translation of intention to behaviour, or the lack thereof. Meanwhile, the practicality of intention as a predictor of behaviour is challenged because of it being heavily nuanced.

The following conclusions were obtained through the analysis of both quantitative and qualitative results. (1) While all the three preceding factors were found to be statistically significant, awareness of consequences was revealed to be practically significant as it showed the most predominant effect on personal norms. (2) Personal norms mediates the relationship of awareness of consequences to recycling intention. (3) Despite being found to be statistically related to behaviour, the practicality of intention as a determinant of behaviour is challenged due to it being heavily nuanced. For some individuals whose intentions are driven by their personal norms, results indicate that there is, indeed, a translation to behaviour. However, for others, the significance of personal norms becomes less pronounced as it is diluted by barriers they deem too difficult to overcome. (4) Therefore, perceived behavioural control significantly affects how intention influences behaviour. In fact, it moderates the execution or non-execution of recycling intention to behaviour. The identified barriers to recycling were the perceived degree of convenience and not knowing the specifics of recycling, which lie within the context of perceived behavioural control. Across all categories, perceived behavioural control is the determinant that remains undisputed in terms of significance.

Recommendations

The researchers quantitatively and qualitatively determined the factors influencing recycling intention, recycling behaviour, and the gap between them. The study also aligns with (1) SDG No. 12 Responsible Consumption and Production and (2) SDG No. 17 Partnership for the Goals. Grounded on SDG No. 12, which aims to decouple economic growth from environmental

degradation, this study identified issues and opportunities the e-commerce industry can address to promote recycling behaviour. Meanwhile, SDG No. 17 is advocated by this study as it encourages institutions (i.e., government, recycling organizations, and e-commerce platforms) to collaborate and coordinate policies and initiatives that encourage and stimulate recycling behaviour. E-commerce platforms can use these findings to assess their respective value chains and create solutions that would induce recycling behaviour, focusing on accessibility and convenience. Parallel to this, the Philippine government can empower e-commerce platforms, recycling drives, and local government units by supporting them vis-a-vis their operations and programme implementation.

E-Commerce Industry

Banking on the finding from this study, e-commerce platforms can pilot interventions that would alleviate the identified barriers to recycling, focusing on addressing the perceived degree of convenience. A possible course of action is to welcome and pursue cross-sector partnerships to fulfill mutual sustainability goals and sustain operational efficiency – such as partnering with recycling drives. This partnership can be an incentivized solution wherein, during the delivery of a parcel to a customer, the rider can also collect the customer's product delivery packaging waste. After doing so, customers will receive rewards points (e.g., Shopee coins) in their e-commerce accounts. The e-commerce industry can, thus, be an enabler for external support by easing the process of participating in recycling drives. In a broader sense, it can streamline the recycling process from the customer's perspective, encouraging them to recycle. It can also enhances efficiency and lessens carbon footprint as parcel delivery and waste pick-up happen simultaneously.

Moreover, from the shopper's perspective, this process also addresses their perceived degree of convenience as it eliminates the need to travel to drop-off points. This can also benefit e-commerce platforms as it strengthens their corporate social responsibility (CSR) and brand reputation by using their influence for good. They gain recognition and in turn, more consumers by encouraging and being dedicated to sustainable methods and recycling initiatives. According to a study by Kiran and Sharma (2011), businesses that implement and commit to CSR practices enhance their reputation, attracting more business partners and gaining greater business

opportunities. Furthermore, this enhanced social image will attract more consumers, consequently, increasing sales and bringing the business more profits.

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