CHAPTER 4

HYPOHESIS TESTING AND ANALYSIS

This chapter presents the findings from the measurement model (outer model) and structural model (inner model) evaluations. The analysis was conducted using SmartPLS with the Partial Least Squares Structural Equation Modelling (PLS-SEM) method.

4.1. Measurement Model Evaluation (Outer Model)

To assess the connection between constructs and their corresponding measurement indicators, the measurement model (outer model) test must be performed (J. Hair & Alamer, 2022). According to J. F. Hair et al. (2021), the measurement model assessment (outer model) consists of tests for discriminant validity, convergent validity, and indicator reliability. The following output were generated from the data analysis processing can be observed in Figure 4.

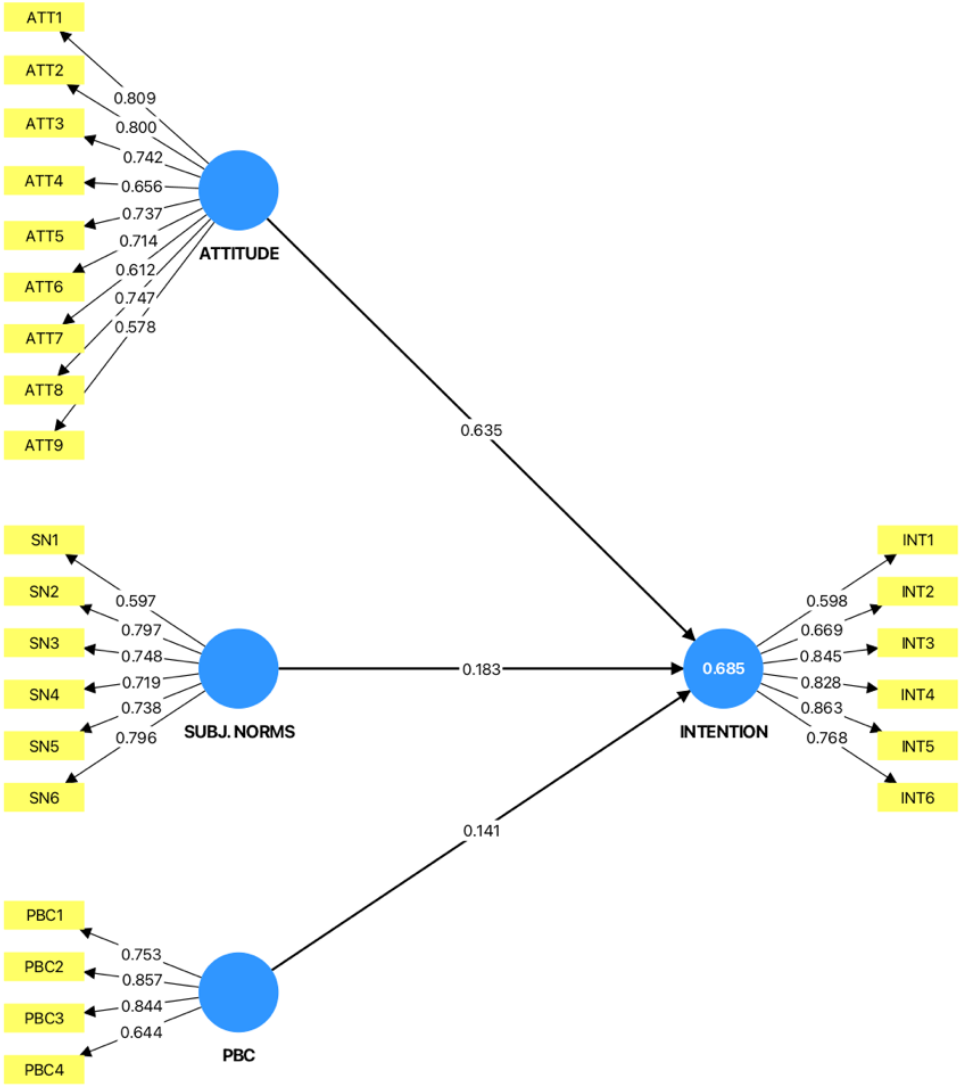

Figure 4. 1 Outer Model Output Phase 1

4.1.1. Indicator Reliability Test (Individual Item)

The purpose of the individual item reliability test is to determine how much each indicator's variance can be accounted for by the relevant construct. The outer loading values produced by the PLS-SEM analysis using SmartPLS 4 are used to assess indicator reliability. According to Hair et al. (2021), the recommended threshold value for outer loading is ≥ 0.708. However, indicators with loading

values between 0.40 and 0.70 may still be retained if deleting the indicators does not improve internal consistency reliability, as reflected by Cronbach's Alpha and Composite Reliability values, or convergent validity, as indicated by the Average Variance Extracted (AVE) value.

Indicator Reliability Test (Individual Item) Phase 1

Table 4. 1 Validity and Reliability Test

	Attitude Towards Plastic Waste (ATT)	**Subjective Norms Towards Plastic Waste (SN)**	**Perceived Control Behavior Towards Plastic Waste (PBC)**	**Intention to Reduce Online Shopping (INT)**
ATT1	0.809			
ATT2	0.800			
ATT3	0.742			
ATT4	0.656			
ATT5	0.737			
ATT6	0.714			
ATT7	0.612			
ATT8	0.747			
ATT9	0.578			
SN1		0.597		
SN2		0.797		
SN3		0.748		
SN4		0.719		
SN5		0.738		
SN6		0.796		
PBC1			0.753	
PBC2			0.857	
PBC3			0.844	
PBC4			0.644	
INT1				0.598
INT2				0.669
INT3				0.845
INT4				0.828
INT5				0.863
INT6				0.768

Source: Data Process, 2026

During the first stage of the indicator reliability (individual item reliability) assessment, several measurement items from the constructs Attitude (ATT), Subjective Norms (SN), Perceived Behavioural Control (PBC), and Intention (INT) were found to have outer loading values below the threshold of 0.708. These items include ATT4 (0.656), ATT7 (0.612), ATT9 (0.578), SN1 (0.597), PBC4 (0.644), and INT1 (0.598). According to Hair et al. (2021), indicator loadings ranging from 0.40 to 0.70 may still be retained if their removal does not lead to a meaningful improvement in internal consistency reliability, as assessed through Cronbach's Alpha and Composite Reliability, or in convergent validity, as assessed through the Average Variance Extracted (AVE).

Table 4. 2 Comparison of Outer Loading Values for Selected Attitude Items

Item	Outer Loading	Cronbach's Alpha		Composite Reliability		AVE		Decision
		Before Eliminated	After Eliminated	Before Eliminated	After Eliminated	Before Eliminated	After Eliminated	
ATT 4	0.656	0.878	0.870	rho_a = 0.892 rho_c = 0.903	rho_a = 0.885 rho_c = 0.898	0.510	0.527	Item Retained
ATT 7	0.612		0.873		rho_a = 0.887 rho_c = 0.900		0.533	Item Retained
ATT 9	0.578		0.876		rho_a = 0.889 rho_c = 0.902		0.538	Item Retained

As presented in Table 4.2, the elimination of ATT4, ATT7, and ATT9 slightly increased the Average Variance Extracted (AVE) value of the Attitude (ATT) construct from 0.510 to 0.527, 0.533, and 0.538, respectively. However, this improvement was accompanied by decreases in both Cronbach's Alpha and Composite Reliability values. Specifically, the Cronbach's Alpha value decreased

from 0.878 to 0.870, 0.873, and 0.876 following the removal of ATT4, ATT7, and ATT9, respectively. Similarly, the Composite Reliability values declined, with rho_a decreasing from 0.892 to 0.885, 0.887, and 0.889, and rho_c decreasing from 0.903 to 0.898, 0.900, and 0.902, respectively. According to Hair et al. (2021), indicators that have outer loadings between 0.40 and 0.70 may be retained if their removal does not lead to a substantial improvement in internal consistency reliability or convergent validity. Therefore, since the elimination of ATT4, ATT7, and ATT9 did not result in an overall improvement in the reliability and validity of the construct, **all three indicators were retained** in the measurement model.

Table 4. 3 Comparison of Outer Loading Values for Selected Subjective Norms Item

Item	Outer Loading	Cronbach's Alpha		Composite Reliability		AVE		Decision
		Before Eliminated	After Eliminated	Before Eliminated	After Eliminated	Before Eliminated	After Eliinated	
SN 1	0.597	0.829	0.829	rho_a = 0.842 rho_c = 0.875	rho_a = 0.841 rho_c = 0.879	0.541	0.594	Item Retained

As presented in Table 4.3, the elimination of SN1 increased the Average Variance Extracted (AVE) value of the Subjective Norms (SN) construct from 0.541 to 0.594. However, this improvement was not accompanied by a meaningful increase in the reliability measures. The Cronbach's Alpha value remained unchanged at 0.829 before and after the elimination of the indicator. Furthermore, while the Composite Reliability value (rho_c) increased slightly from 0.875 to 0.879, the rho_a value decreased marginally from 0.842 to 0.841. According to Hair et al. (2021), indicators with outer loadings between 0.40 and 0.70 may be retained if eliminating it doesn't significantly improve the construct's internal consistency

reliability and convergent validity. Therefore**, SN1 was retained** in the measurement model, as its removal did not lead to a substantial improvement in the reliability and validity of the Subjective Norms construct.

Table 4. 4 Comparison of Outer Loading Values for Selected Perceived Behavioural Control Item

Item	Outer Loading	Cronbach's Alpha		Composite Reliability		AVE		Decision
		Before Elimination	After Elimination	Before Elimination	After Elimination	Before Elimination	After Elimination	
PBC 4	0.644	0.779	0.798	rho_a = 0.797 rho_c = 0.859	rho_a = 0.807 rho_c = 0.881	0.607	0.713	Item Eliminated

As presented in Table 4.4, the elimination of PBC4 resulted in improvements across all reliability and validity measures of the Perceived Behavioral Control (PBC) construct. The Average Variance Extracted (AVE) value increased from 0.607 to 0.713 following the removal of the indicator. In addition, the Cronbach's Alpha value increased from 0.779 to 0.798. Similarly, the Composite Reliability values improved, with rho_a increasing from 0.797 to 0.807 and rho_c increasing from 0.859 to 0.881. According to Hair et al. (2021), indicators with outer loadings between 0.40 and 0.70 should be considered for removal when their elimination leads to substantial improvements in the construct's reliability and validity measures. Therefore, **PBC4 was eliminated** from the measurement model, as its removal improved the overall reliability and validity of the Perceived Behavioral Control construct.

Table 4. 5 Comparison of Outer Loading Values for Selected Intention Items

Item	Outer Loading	Cronbach's Alpha		Composite Reliability		AVE		Decision
		Before Eliminated	After Eliminated	Before Eliminated	After Eliminated	Before Eliminated	After Eliminated	
INT 1	0.598	0.857	0.863	rho_a = 0.875 rho_c = 0.895	rho_a = 0.879 rho_c = 0.902	0.590	0.651	Item Eliminated
INT 2	0.669		0.847		rho_a = 0.867 rho_c = 0.893		0.631	Item Retained

All reliability and validity measurements of the Intention (INT) construct improved with the removal of INT1, as shown in Table 4.5. After the indicator was eliminated, the Average Variance Extracted (AVE) value rose from 0.590 to 0.651. Furthermore, the Cronbach's Alpha score rose from 0.857 to 0.863. The Composite Reliability values also increased, with rho_a rising from 0.875 to 0.879 and rho_c rising from 0.895 to 0.902. Indicators with outer loadings between 0.40 and 0.70 should be eliminated when doing so significantly improves the construct's validity and reliability metrics, according to Hair et al. (2021). As a result, INT1 was removed from the measurement model since doing so increased the Intention construct's overall validity and reliability.

Following the elimination of INT1, INT2 was re-evaluated. The results indicated that eliminating INT2 would reduce the Cronbach's Alpha value from 0.863 to 0.847, the Composite Reliability values from rho_a = 0.879 to rho_a = 0.867 and from rho_c = 0.902 to rho_c = 0.893, as well as the AVE value from 0.651 to 0.631. Therefore, **INT2 was retained and INT1 was eliminated** in the

measurement model, as its removal would negatively affect the reliability and validity of the Intention construct.

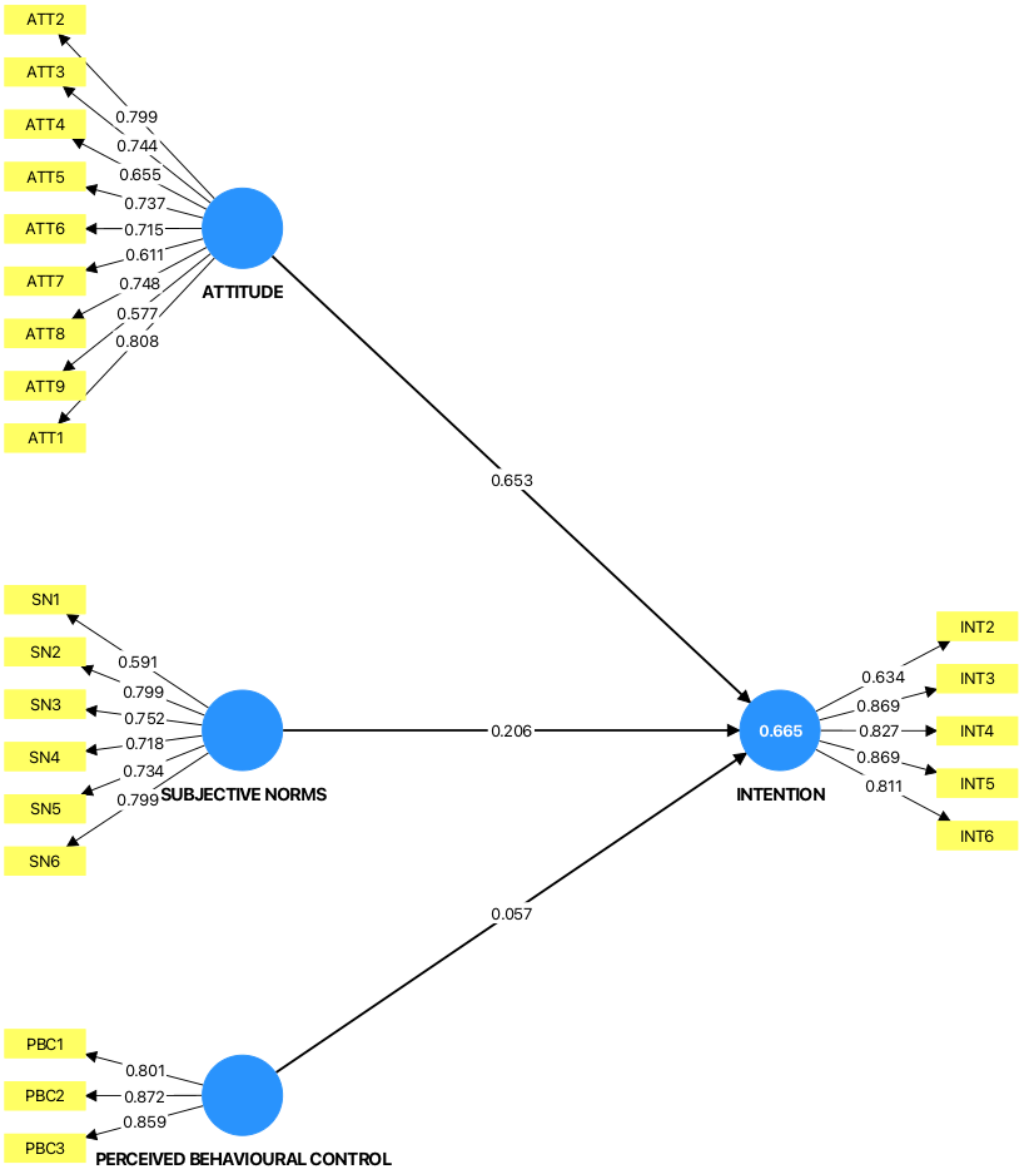

Figure 4. 2 Outer Model Output Phase 2

Source: Data Process, 2026

Indicator Reliability Test (Individual Item) Phase 2

Table 4. 6 Table Indicator Reliability Test Phase 2

	Attitude Towards Plastic Waste (ATT)	Subjective Norms Towards Plastic Waste (SN)	Perceived Control Behavior Towards Plastic Waste (PBC)	Intention to Reduce Online Shopping (INT)
ATT1	0.808			
ATT2	0.799			
ATT3	0.744			
ATT4	0.655			
ATT5	0.737			
ATT6	0.715			
ATT7	0.611			
ATT8	0.748			
ATT9	0.577			
INT2		0.634		
INT3		0.869		
INT4		0.827		
INT5		0.869		
INT6		0.811		
PBC1			0.801	
PBC2			0.872	
PBC3			0.859	
SN1				0.591
SN2				0.799
SN3				0.752
SN4				0.718
SN5				0.734
SN6				0.799

Source: Data Process, 2026

As presented in Table 4.6, the second phase of the indicator reliability (individual item reliability) test showed that most indicators achieved outer loading values above the recommended threshold of 0.708. Specifically, all indicators of the Perceived Behavioral Control (PBC) construct demonstrated satisfactory outer loading values, ranging from 0.801 to 0.872.

However, ATT4 (0.655), ATT7 (0.611), ATT9 (0.577), INT2 (0.634), and SN1 (0.591) exhibited outer loading values between 0.40 and 0.70. According to Hair et

al. (2021), indicators with outer loadings within this range may still be retained if their removal does not substantially improve the construct's internal consistency reliability and convergent validity. As demonstrated in the previous reliability and validity assessments, the elimination of these indicators did not lead to meaningful improvements in the measurement quality of their respective constructs. Therefore, these indicators were retained in the model. Therefore, it can be concluded that all indicators included in the second-phase measurement model met the indicator reliability requirements and were retained for subsequent validity and reliability assessments.

4.1.2. Internal Consistency Reliability Test

The purpose of the internal consistency reliability test is to evaluate the amount of relationship between indicators (items) that measure the same construct (Hair et al., 2021). Cronbach's Alpha and Composite Reliability (CR) measurements are used to assess internal consistency reliability. Hair et al. (2022) state that for both values to be recognized acceptable, they must be at least 0.70. Reliability levels above 0.95, however, may point to possible problems because they imply that the indicators are assessing the same part of the construct and may therefore be redundant. Table 4.7 displays the findings of this study's internal consistency reliability test.

Table 4. 7 Reliability Test

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Attitude Towards Plastic Waste	0.878	0.892	0.903	0.510
Intention to Reduce Online	0.863	0.880	0.902	0.651
Perceived Behavioural Control Toward Plastic Waste	0.798	0.804	0.882	0.713
Subjective Norm Towards Plastic Waste	0.829	0.844	0.875	0.541

Source: Data Process, 2026

Based on Table 4.7, all constructs achieved Cronbach's Alpha and Composite Reliability (CR) values above the minimum threshold of 0.70, with no values exceeding 0.95. Therefore, it can be concluded that all constructs met the internal consistency reliability criteria and were deemed reliable for further analysis.

4.1.3. Convergent Validity Test

To determine how much a construct is empirically separate from other constructs in the structural model, the discriminant validity test is used. The Heterotrait–Monotrait Ratio (HTMT) is used to assess discriminant validity instead of the Fornell-Larcker criterion, which has been deemed less accurate in identifying discriminant validity problems. HTMT is defined as the geometric mean of the average correlations among indicators measuring the same construct (i.e., monotrait–heteromethod correlations) divided by the average correlation of indicators across different constructs (i.e., heterotrait–heteromethod correlations).

According to Hair et al. (2021), HTMT values below 0.85 indicate adequate discriminant validity for conceptually distinct constructs, while values below 0.90 are acceptable for constructs that are conceptually similar. The results of the convergent validity test in this study can be observed in Table 4.8.

Table 4. 8 Convergent Validity Test

	Average Variance Extracted (AVE)
Attitude (ATT)	0.510
Subjective Norms (SN)	0.651
Perceived Control Behavior (PBC)	0.713
Intention (INT)	0.541

Source: Data Process, 2026

Based on Table 4.8, all constructs achieved AVE values above the minimum threshold of 0.50. Specifically, the AVE values for Attitude (ATT), Subjective Norms (SN), Perceived Control Behavior (PBC), and Intention (INT) were 0.510, 0.651, 0.713, and 0.541, respectively. Therefore, it can be concluded that all constructs satisfied the convergent validity requirements and were considered valid.

4.1.4. Discriminant Validity Test

The discriminant validity test is conducted to assess the extent to which a construct is empirically distinct from other constructs within the structural model. Discriminant validity is evaluated using the Heterotrait–Monotrait Ratio (HTMT), which serves as an alternative to the Fornell-Larcker criterion, as the latter is considered less reliable in assessing discriminant validity. HTMT is defined as the average correlation of indicators across different constructs (i.e., heterotrait–heteromethod correlations) relative to the geometric mean of the average correlations among indicators measuring the same construct (i.e., monotrait–

heteromethod correlations). According to Hair et al. (2021), HTMT values below 0.85 are considered acceptable for conceptually distinct constructs, whereas values below 0.90 are acceptable for conceptually similar constructs. The results of the discriminant validity assessment are presented in Table 4.9.

Table 4. 9 Discriminant Validity Test

	Attitude	Intention	Perceived Behavioural Control	Subjective Norm
Attitude				
Intention	0.883			
Perceived Behavioural Control	0.438	0.527		
Subjective Norm	0.631	0.711	0.747	

Source: Data Process, 2026

According to Table 4.9, the majority of HTMT values fell below the suggested cutoff point of 0.85. Hair et al. (2021) advocated a more permissive threshold of 0.90 for conceptually related items, yet the HTMT value for Attitude Towards Plastic Waste and Intention to Reduce Online Shopping was 0.883. Consequently, it can be said that every construct met the requirements for discriminant validity and was deemed legitimate.

4.2. Structural Evaluation Model (Inner Model)

The structural model assessment in PLS-SEM focuses on evaluating the explanatory and predictive power of the model. This assessment is conducted to determine the model's ability to explain and predict one or more constructs. Several tests are carried out in the inner model evaluation, namely the collinearity test, path

coefficient test, R-square test, and f-square (explanatory power) test (Hair et al., 2022).

4.2.1. Collinearity Test

The collinearity test is carried out because the ordinary least squares (OLS) approach, which is used to estimate path coefficients in the structural model, may yield skewed results when there is considerable collinearity among the predictor constructs. The Variance Inflation Factor (VIF) values are used to evaluate collinearity. Hair et al. (2022) state that VIF values should be less than five, with values less than three being preferred. Table 4.10 displays the findings of this study's collinearity test.

Table 4. 10 Collinearity Test

Relationship Between Variables	**VIF**
Attitude (ATT) → Intention (INT)	1.468
Perceived Control Behaviour (PBC) → Intention (INT)	1.558
Subj. Norms (SN) → Intention (INT)	1.951

Source: Data Process, 2026

Based on Table 4.10, all VIF values were below 3. Therefore, it can be concluded that all constructs satisfied the collinearity requirements and that no collinearity issues were detected in the structural model.

4.2.2. Path Coefficient Test

The path coefficient test is conducted to assess the strength and direction of the relationships among constructs in the structural model. In this test, several values are examined, namely the path coefficients (original sample), T-statistics, and P-

values. The path coefficient indicates the strength and direction of the relationship between variables in the model. Path coefficient values generally range from -1 to +1, where values closer to +1 or -1 indicate a stronger relationship, while values closer to 0 indicate a weaker relationship. The results are considered significant when the T-statistic value exceeds the critical T-table value. In this study, a significance level of 5% was applied, resulting in a critical value of 1.96. Furthermore, for P-values, the results are considered significant when the value is less than 0.05 (Hair et al., 2022).

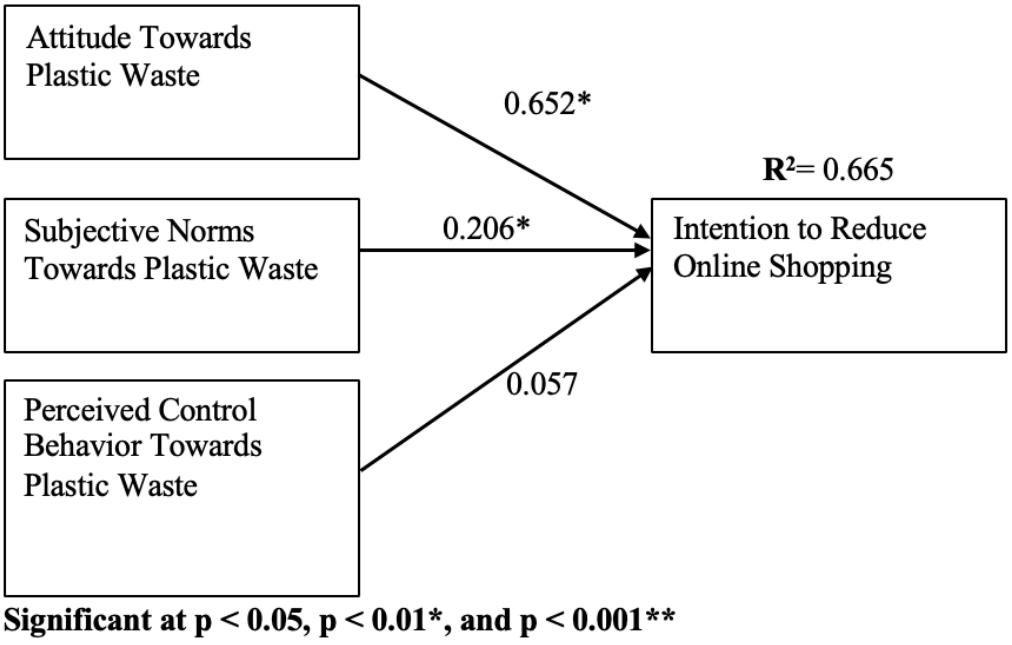

Figure 4. 3 Path Coefficient

Source: Data Process, 2026

Based on the bootstrapping test results presented in Table 4.11, hypothesis testing was conducted by examining the path coefficient values, T-statistics, and P-values. The findings of each hypothesis test are explained as follows:

Table 4. 11 Path Coefficient

	Original sample (O)	**Sample mean (M)**	**Standard deviation (STDEV)**	**T statistics (|O/STDEV|)**	**P values**
Attitude → Intention	0.653	0.656	0.042	15.702	0.000
Perceived Control Behaviour → Intention	0.057	0.055	0.069	0.824	0.205
Subj. Norms → Intention	0.206	0.207	0.054	3.822	0.000

Source: Data Processing, 2026

Based on Table 4.11, the findings from the hypothesis testing conducted using the bootstrapping analysis model can be summarized as follows:

H1: Attitude Towards Plastic Waste has an influence on Intention to Reduce Online Shopping.

Attitude Towards Plastic Waste has a path coefficient value of 0.653, a P-value of 0.000, and a T-statistic value of 15.702, according to the results of the bootstrapping study for the first hypothesis. The T-statistic surpasses the essential T-value of 1.96 at the 5% significance level, but the P-value is below the predefined significance level of 0.05. Thus, the hypothesis is accepted in this study and it can be concluded that Attitude Towards Plastic Waste has a positive and significant influence on Intention to Reduce Online Shopping.

The findings of this study are consistent with previous studies that investigated the role of attitude in shaping pro-environmental intentions. Oduro-Appiah et al. (2024) found that attitude was one of the strongest determinants of individuals' intentions to prevent litter and plastic pollution in Ghana. Similarly, Lee (2023) reported that environmental attitudes significantly influenced

consumers' intentions to adopt circular packaging practices in online shopping. The findings are also in line with Lianita et al. (2024), who found that attitude positively and significantly influenced Generation Z's intention to purchase products with eco-friendly packaging.

These previous studies share a common focus with the present research, namely examining how attitudinal evaluations toward environmental issues shape behavioural intentions within the framework of the Theory of Planned Behavior (TPB). The findings suggest that when individuals develop favourable attitudes toward reducing plastic waste, they are more likely to form intentions to engage in environmentally responsible behaviours. In the context of this study, respondents who perceive plastic waste as an important environmental issue tend to have stronger intentions to reduce their online shopping activities as a preventive effort to minimize plastic packaging waste.

H2: Subjective Norms Towards Plastic Waste has an influence on Intention to Reduce Online Shopping.

The findings from the bootstrapping analysis for the second hypothesis indicate that Subjective Norms Towards Plastic Waste have a path coefficient value of 0.206, a P-value of 0.000, and a T-statistic value of 3.822. The P-value is lower than the predetermined significance level of 0.05, while the T-statistic exceeds the critical T-value of 1.96 at the 5% significance level. Therefore, it can be concluded that Subjective Norms Towards Plastic Waste have a positive and significant influence on Intention to Reduce Online Shopping, and the hypothesis is accepted in this study.

The findings of this study are consistent with previous studies examining the role of subjective norms in promoting environmentally responsible behaviour. Widayat et al. (2023) found that subjective norms played a significant role in encouraging pro-environmental behaviour related to post-consumption plastic packaging. Similarly, Lianita et al. (2024) reported that subjective norms positively influenced Generation Z's intention to purchase products with eco-friendly packaging. Furthermore, Sudin et al. (2016) found that subjective norms positively affected recycling behaviour among university students in Malaysia.

The findings indicate that social expectations and perceived social pressure remain important determinants of environmental intentions. Within the TPB framework, subjective norms reflect individuals' perceptions regarding whether significant others approve or encourage a particular behaviour. In the context of this study, when respondents perceive support, encouragement, or expectation from friends, family, and peers to reduce online buying, they are more likely to form an intention to do so.

H3: Perceived Behavioural Control Towards Plastic Waste has an influence on Intention to Reduce Online Shopping.

Perceived Behavioural Control Towards Plastic Waste has a path coefficient value of 0.057, a P-value of 0.205, and a T-statistic value of 0.824, according to the results of the bootstrapping analysis for the third hypothesis. The T-statistic is less than the essential T-value of 1.96 at the 5% significance level, while the P-value above the predefined significance level of 0.05. Thus, the hypothesis is denied in

this study and it can be concluded that Perceived Behavioural Control Towards Plastic Waste does not significantly affect Intention to Reduce Online Shopping.

This study's results are different from those of a number of earlier investigations. According to Widayat et al. (2023), pro-environmental behaviour pertaining to plastic packaging was strongly influenced by perceived behavioural control. In a similar manner, Sudin et al. (2016) found that among Malaysian university students, perceived behavioural control was one of the best indicators of recycling behaviour. According to Lianita et al. (2024), Generation Z's inclination to buy eco-friendly products was positively impacted by perceived behavioural control.

The inconsistency between the present findings and previous studies may be attributed to differences in behavioural context. While previous studies examined behaviours that can be performed directly, such as recycling activities or purchasing eco-friendly products, this study focuses on reducing online shopping frequency. Although respondents may perceive themselves as capable of reducing plastic waste, they may still rely heavily on online shopping due to convenience, accessibility, product availability, promotional incentives, and lifestyle factors. As a result, the perception of behavioural control over plastic waste reduction may not necessarily translate into a stronger intention to reduce online shopping activities.

4.2.3. Theoretical Confirmation

Based on the path coefficient analysis, two out of the three proposed hypotheses were supported. Specifically, Attitude Towards Plastic Waste and Subjective Norms Towards Plastic Waste were found to significantly influence Intention to

Reduce Online Shopping, while Perceived Behavioural Control Towards Plastic Waste did not show a significant influence.

The Theory of Planned Behaviour (TPB) put forward by Ajzen (1991) is somewhat supported by these results. According to TPB, attitude, subjective standards, and perceived behavioural control all influence behavioural intention. In the current study, respondents' intentions to cut back on online purchasing in an attempt to decrease plastic packaging waste were well predicted by attitude and subjective norms.

The significant influence of attitude indicates that respondents who perceive plastic waste as a serious environmental problem tend to be more willing to reduce their online shopping behaviour. Similarly, the significant influence of subjective norms suggests that social expectations and environmental encouragement from important reference groups strengthen behavioural intentions.

On the other hand, the insignificant influence of perceived behavioural control suggests that respondents' perceived ability to reduce plastic waste is not sufficient to encourage intentions to reduce online shopping activities. Therefore, while the findings generally support TPB, the role of perceived behavioural control was not confirmed within the context of reducing plastic packaging waste through online shopping behaviour.

4.2.4. Explanatory Power Test

By measuring the strength of the correlations depicted in the PLS path model, the explanatory power assessment is carried out to determine how well the

research model fits the observed data. R-square (R^2) and f-square (f^2) are the metrics used to perform this evaluation.

The squared correlation between an internal construct's actual and expected values is represented by R-square (R^2). It shows the percentage of variance in the internal construct that can be determined by its predictor constructs, or the total impact of all external latent constructs on an internal latent construct. A value of 0.10 is typically regarded as good enough, with R-square values ranging from 0 to 1. R-square should be interpreted by comparing it with similar studies and research models because it tends to rise when more predictor constructs are added to the model.

Additionally, f-square (f^2) quantifies how the R-square value changes when a particular predictor component is eliminated from the model. It emphasises how each exogenous construct contributes separately to the model's overall capacity for explanation. A minor influence is indicated by an f-square value of 0.02, a medium effect by 0.15, and a high effect by 0.35, according to Hair et al. (2022).

R Square Test

Table 4. 12 R-Square Result

	R-square	**R-square adjusted**
Intention to Reduce Online Shopping (INT)	0.665	0.661

Source: Data Process, 2026

Based on Table 4.12 above, Intention to Reduce Online Shopping (INT) has an R-Square value of 0.665. This value indicates that Attitude Towards Plastic Waste (ATT), Subjective Norms Towards Plastic Waste (SN), and Perceived

Behavioural Control Towards Plastic Waste (PBC) contribute to explaining Intention to Reduce Online Shopping (INT). Furthermore, the value indicates that 66.5% of the variation in Intention to Reduce Online Shopping can be explained by the variables included in this study, while the remaining 33.5% is explained by other factors outside the research model.

F Square Test

Table 4. 13 F-Square Result

	Perceived Behavioural Control (PBC)	Intention to Reduce Online Shopping (INT)	Subjective Norms (SN)	Attitude (ATT)
Perceived Behavioural Control (PBC)		0.006		
Intention to Reduce Online Shopping (INT)				
Subjective Norms (SN)		0.065		
Attitude (ATT)		0.867		

Source: Data Process, 2026

Based on Table 4.13 above, the following conclusions can be drawn:

- The F-Square value of Perceived Behavioural Control Towards Plastic Waste (PBC) on Intention to Reduce Online Shopping (INT) is 0.006. Therefore, the Perceived Behavioural Control Towards Plastic Waste variable has a very small effect on Intention to Reduce Online Shopping. This finding suggests that respondents' perceived ability to reduce plastic waste contributes very little to their intention to reduce online shopping activities. One possible explanation is that respondents may reduce plastic waste through other actions, such as reusing or recycling plastic materials, without necessarily reducing their online shopping behaviour.

- The F-Square value of Subjective Norms Towards Plastic Waste (SN) on Intention to Reduce Online Shopping (INT) is 0.065. Therefore, the Subjective Norms Towards Plastic Waste variable has a small effect on Intention to Reduce Online Shopping.
- The F-Square value of Attitude Towards Plastic Waste (ATT) on Intention to Reduce Online Shopping (INT) is 0.867. Therefore, the Attitude Towards Plastic Waste variable has a large effect on Intention to Reduce Online Shopping.

Based on these findings, Attitude Towards Plastic Waste is the strongest variable influencing Intention to Reduce Online Shopping, followed by Subjective Norms Towards Plastic Waste. Meanwhile, Perceived Behavioural Control Towards Plastic Waste contributes only a very small effect to Intention to Reduce Online Shopping.

4.3. Discussion

In contrast, Perceived Behavioural Control Towards Plastic Waste was found to have no significant influence on Intention to Reduce Online Shopping. According to the Theory of Planned Behavior (Ajzen, 1991), perceived behavioural control reflects an individual's perception of their capability and control over performing a particular behavior. However, the findings of this study suggest that respondents' perceived ability to reduce plastic waste does not necessarily translate into intentions to reduce online shopping activities.

One possible explanation is that respondents may perceive that plastic waste reduction can be achieved through alternative actions without reducing online

shopping itself. For example, consumers may choose to reuse packaging materials, recycle plastic waste, or purchase environmentally friendly products while continuing their online shopping activities. As a result, the perceived ability to reduce plastic waste may not directly influence their intention to reduce online shopping.

Furthermore, the insignificant effect of perceived behavioural control may be explained through the concept of collective efficacy. Plastic waste is a collective environmental issue that requires collective action from consumers, businesses, e-commerce platforms, and policymakers. Respondents may believe that reducing their own online shopping activities would not significantly reduce plastic packaging waste if other consumers continue purchasing online and sellers continue using plastic packaging materials. Consequently, although respondents perceive themselves as capable of reducing plastic waste, they may not believe that their individual actions alone are sufficient to generate meaningful environmental change.

In addition, consumers have limited control over the packaging materials used in online shopping transactions. Packaging decisions are generally determined by sellers, logistics providers, and e-commerce platforms rather than consumers themselves. Therefore, even if consumers intend to reduce plastic waste, they may perceive that the problem is not entirely within their personal control. The insignificant impact of perceived behavioural control on intention may therefore be due to consumers' belief that reducing plastic packaging waste requires changes

from businesses and the broader marketplace ecosystem rather than solely from individual consumers.

This finding is consistent with Khan et al. (2019), who found that perceived behavioural control did not significantly influence consumers' intentions to engage in plastic waste return and recycling behaviour. The authors suggested that environmental behaviours often depend on external facilities, recycling systems, and supporting infrastructure rather than solely on individuals' perceived capabilities. Similarly, the present study indicates that respondents may perceive plastic waste reduction as a responsibility that extends beyond their individual control.

The findings are also supported by research on plastic waste reduction behavioural intention, which suggested that situational and environmental factors may play a more important role than perceived behavioural control in shaping individuals' intentions to reduce plastic waste. This indicates that environmental behaviours often require support from external conditions and collective participation, which may weaken the influence of perceived behavioural control on behavioural intention.

Therefore, although perceived behavioural control is theoretically expected to predict behavioural intention under the Theory of Planned Behavior, the findings of this study suggest that in the context of reducing plastic packaging waste through online shopping, attitudes and subjective norms are more influential determinants of intention than perceived behavioural control.