












Centennials' happiness and sustainable packaging: A TPB approach to consumer behaviour

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Abstract

Objective: This research examines the purchase intention of products with sustainable packaging among centennials, integrating consumer happiness as a mediator within the framework of the Theory of Planned Behaviour (TPB). It analyses how attitudes, subjective norms, and perceived behavioural control influence consumer happiness and, in turn, purchase intention. **Method:** Using a quantitative, non-experimental, cross-sectional design, data were collected from 390 university students through structured questionnaires with Likert scales. Structural Equation Modelling (SEM) was applied to assess the relationships between TPB variables and consumer happiness as a mediator. **Originality/Relevance:** This study expands Ajzen's TPB by incorporating consumer happiness as a mediating construct between attitudes, subjective norms, perceived control, and purchase intention for products with sustainable packaging. It provides a comprehensive perspective on how sustainable purchasing decisions are influenced by emotional factors beyond cognitive and social determinants. **Results:** Findings confirm that attitudes, subjective norms, and perceived control significantly influence consumer happiness, which serves as a direct mediator of purchase intention. Happiness amplifies the relationships between TPB variables and pro-environmental behaviour. **Theoretical/Methodological Contributions:** This research positions consumer happiness as a bridge between functional and emotional benefits of sustainable packaging, reinforcing the TPB framework. The use of SEM validates its role as a mediator in sustainable purchasing behaviour. **Social/Managerial Contributions:** The findings provide practical implications for companies targeting centennials, highlighting the need to emphasise both the functional and emotional benefits of products with sustainable packaging in marketing strategies.

Keywords: TPB, sustainability, consumption, happiness, marketing, centennials

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Resumen

La felicidad de los centennials y los empaques sostenibles: Un enfoque TCP del comportamiento del consumidor

Objetivo: Esta investigación examina la intención de compra de productos con empaques sostenibles entre los centennials, integrando la felicidad del consumidor como variable mediadora en el marco de la Teoría del Comportamiento Planificado (TCP). Se analiza cómo las actitudes, las normas subjetivas y el control conductual percibido influyen en la felicidad del consumidor y, a su vez, en la intención de compra. **Método:** Mediante un diseño cuantitativo, no experimental y de corte transversal, se recolectaron datos de 390 estudiantes universitarios a través de cuestionarios estructurados con escalas tipo Likert. Se aplicó el Modelado de Ecuaciones Estructurales (SEM) para evaluar las relaciones entre las variables de la TCP y la felicidad del consumidor como mediadora. **Originalidad/Relevancia:** Este estudio amplía la TCP de Ajzen al incorporar la felicidad del consumidor como constructo mediador entre las actitudes, las normas subjetivas, el control percibido y la intención de compra de productos con empaques sostenibles. Asimismo, ofrece una perspectiva integral sobre cómo las decisiones de compra sostenible están influenciadas por factores emocionales, más allá de los determinantes cognitivos y sociales. **Resultados:** Los hallazgos confirman que las actitudes, las normas subjetivas y el control percibido influyen significativamente en la felicidad del consumidor, la cual actúa como mediadora directa de la intención de compra. La felicidad fortalece las relaciones entre las variables de la TCP y el comportamiento proambiental. **Contribuciones teóricas/metodológicas:** Esta investigación posiciona la felicidad del consumidor como un puente entre los beneficios funcionales y emocionales de los empaques sostenibles, reforzando el marco de la TCP. El uso de SEM valida su papel como mediadora en el comportamiento de compra sostenible. **Contribuciones sociales/gerenciales:** Los hallazgos ofrecen implicaciones prácticas para las empresas dirigidas al segmento centennial, al resaltar la necesidad de enfatizar tanto los beneficios funcionales como emocionales de los productos con empaques sostenibles dentro de las estrategias de marketing.

Palabras-clave: TCP, sostenibilidad, consumo, felicidad, marketing, centennials

Resumo

A felicidade dos centennials e as embalagens sustentáveis: Uma abordagem da TCP ao comportamento do consumidor

Objetivo: Esta pesquisa examina a intenção de compra de produtos com embalagens sustentáveis entre os centennials, integrando a felicidade do consumidor como variável mediadora no âmbito da Teoria do Comportamento Planejado (TCP). Analisa-se como as atitudes, as normas subjetivas e o controle comportamental percebido influenciam a felicidade do consumidor e, por sua vez, a intenção de compra. **Método:** Por meio de um desenho quantitativo, não experimental e transversal, foram coletados dados de 390 estudantes universitários através de questionários estruturados com escalas do tipo Likert. Aplicou-se a Modelagem de Equações Estruturais (SEM) para avaliar as relações entre as variáveis da TCP e a felicidade do consumidor como mediadora. **Originalidade/Relevância:** Este estudo amplia a TCP de Ajzen ao incorporar a felicidade do



consumidor como construto mediador entre as atitudes, as normas subjetivas, o controle percebido e a intenção de compra de produtos com embalagens sustentáveis. Além disso, oferece uma perspectiva abrangente sobre como as decisões de compra sustentável são influenciadas por fatores emocionais, para além dos determinantes cognitivos e sociais. **Resultados:** Os achados confirmam que as atitudes, as normas subjetivas e o controle percebido influenciam significativamente a felicidade do consumidor, a qual atua como mediadora direta da intenção de compra. A felicidade fortalece as relações entre as variáveis da TCP e o comportamento pró-ambiental. **Contribuições teóricas/metodológicas:** Esta pesquisa posiciona a felicidade do consumidor como uma ponte entre os benefícios funcionais e emocionais das embalagens sustentáveis, reforçando o arcabouço da TCP. O uso de SEM valida seu papel como mediadora no comportamento de compra sustentável. **Contribuições sociais/gerenciais:** Os achados oferecem implicações práticas para empresas direcionadas ao segmento centennial, ao destacar a necessidade de enfatizar tanto os benefícios funcionais quanto emocionais dos produtos com embalagens sustentáveis nas estratégias de marketing.

Palavras-chave: TCP, sustentabilidade, consumo, felicidade, marketing, centennials

1 Introduction

In recent years, interest in sustainability has grown significantly across economic and social sectors, prioritising environmentally responsible practices (Lăzăroiu et al., 2020). This phenomenon reflects the urgent need to address the environmental crisis, characterised by the depletion of natural resources and the necessity of adopting sustainable models (Hariram et al., 2023). Generation Z, also known as centennials, those born between 1997 and 2012, with their ecological awareness, are leading this change by demanding products and services aligned with ethical and sustainable principles, transforming consumption values (Djafarova & Fouts, 2022). Furthermore, this generation drives trends that prioritise responsible practices, directly influencing business strategies (Triquet, 2020). In this way, sustainable packaging stands out as a solution to mitigate environmental pollution while meeting the expectations of conscious consumers, strengthening their purchasing decisions (Tapia-Sisalim, 2020).

In this context, the willingness to buy products with sustainable packaging has been widely studied using the Theory of Planned Behaviour (TPB) (Chang et al., 2022). This theoretical framework explains how attitude toward behaviour, subjective norms, and perceived behavioural control influence consumers' intentions to adopt sustainable practices (Ajzen, 1991; Lavuri, 2021). These factors are particularly essential for understanding the behaviour of centennials, as their decisions aim not only to satisfy functional needs but also to align with ethical and pro-

environmental values (Jiménez et al., 2020). Thus, the TPB provides a solid foundation for analysing how this generation integrates its ideals into purchasing decisions, highlighting sustainable packaging as a solution aligned with their expectations (Rosidah, 2024).

On the other hand, consumer happiness has emerged as a notable component in marketing literature, particularly in relation to sustainable consumption (Chéron et al., 2021). This concept is linked to the well-being consumers experience when engaging in practices aligned with their moral and environmental principles, reinforcing their sense of purpose and personal satisfaction (Lisboa et al., 2022; Xiao & Li, 2010). In this regard, sustainable packaging not only serves a practical function but also represents a symbol of social commitment, strengthening consumer loyalty towards brands that share their convictions (Armutcu & Tan, 2023; Guevara & Aldana, 2023).

Despite advancements in the literature, there are still areas of opportunity in this field of study. Firstly, while attitude and perceived behavioural control have been identified as relevant determinants of the intention to purchase sustainable packaging, the relationship between these variables and consumer happiness has not been fully explored (Mison et al., 2023). Secondly, the influence of subjective norms on centennials still yields contradictory results, suggesting the need for studies that delve deeper into the role of specific social and cultural influences on this generation (Qazi et al., 2023). Finally, integrating consumer happiness into the TPB model to evaluate its impact on the intention to purchase sustainable packaging represents an underexplored area of study with high potential for developing effective marketing strategies (Lisboa et al., 2022).

Therefore, this research aims to analyse the intention to purchase sustainable packaging among centennials, considering the role of consumer happiness as a mediator and the variables of the Theory of Planned Behaviour. The article is structured as follows: first, a review of the literature on relevant factors influencing the intention to purchase sustainable products is presented; second, the methodology used to collect and analyse the data is described; subsequently, the results are presented and discussed; and finally, the conclusions and recommendations for future research are outlined.

2 Literature Review

2.1 Purchase intention

Purchase intention has gained a prominent position in consumer behaviour research, particularly in the context of sustainable consumption (González-Cabrera & Trelles-Arteaga, 2021). This concept is defined as an individual's willingness to acquire products that reflect their



personal values and environmental concerns (Marsilla & Sánchez, 2020). In a global context, the intention to purchase sustainable packaging has emerged as a practice to reduce waste and meet the expectations of conscious consumers, with centennials standing out due to their ethical values and environmental awareness (Abrar et al., 2021). This generation demands products that integrate sustainability principles into their design, not only for functional reasons but also as an extension of their social values (Song et al., 2020), providing a sense of happiness by aligning with their pro-environmental ideals (Polisetty et al., 2024).

Building on these insights, various studies have explored the relationship between purchase intention and consumer happiness, indicating that consumers experience greater satisfaction and well-being when purchasing products aligned with their ecological values (Armutcu & Tan, 2023; Lakatos et al., 2021). A notable example is a study conducted by Misron et al. (2023) in Malaysia with a sample of 385 consumers, which found that consumers experience higher satisfaction when consuming products aligned with their environmental values, increasing their willingness to purchase such products. However, other studies have shown contradictory findings. For instance, Xu et al. (2022) in China, with a sample of 516 consumers, suggest that happiness is not a universal determinant. In certain contexts, factors such as perceived environmental risk and social responsibility may play a more important role in determining purchase intention.

Furthermore, the Theory of Planned Behaviour (TPB) has been empirically validated as effective in promoting purchase intention toward sustainable products through attitude, subjective norms, and perceived behavioural control (Müller et al., 2021). A study by Chang et al. (2022), involving 385 vegetarian restaurant consumers, demonstrated that positive attitudes, subjective norms, and perceived behavioural control significantly explain purchase intention. In contrast, the study by Zis, Effendi, and Roem (2021) highlighted that perceived control in digital contexts might have a more limited effect if consumers face practical barriers such as a lack of information about the sustainable benefits of products.

2.2 Consumer happiness

Happiness, despite being a widely analysed concept across various fields, remains a complex construct that can be approached from different theoretical and empirical perspectives (De Sousa, 2020; Galván-Vela et al., 2024). Broadly, happiness is defined as a sense of subjective well-being and personal satisfaction, a perception that life has meaning and value (Castrillon et al.,



2020; Salazar-Altamirano et al., 2024). However, recent literature has explored the relationship between happiness and consumption patterns, giving rise to the concept of consumer happiness (Cachero-Martínez, 2020). This concept describes the feeling of satisfaction and pleasure that consumers experience when purchasing products that reflect their personal and social values, such as those related to sustainability (Arora & Manchanda, 2022).

Recent studies have examined happiness alongside sustainable consumption patterns, highlighting its influence on purchasing decisions. For example, research by Misron et al. (2023) in a university context found that Generation Z youth show a significant emotional connection with brands that promote sustainability, increasing their satisfaction and loyalty towards these brands. This phenomenon has sparked growing academic interest in exploring how positive emotions interact with classical consumer behaviour variables such as attitudes and social norms (Tastan et al., 2020).

Regarding the relationship between consumer happiness and the Theory of Planned Behaviour (TPB), recent studies have yielded intriguing findings. A study conducted in Malaysia by Chang et al. (2022), involving a sample of 385 consumers, revealed that positive attitudes and subjective norms directly influence the decision to buy sustainable products, while perceived behavioural control plays a moderating role. This study highlights the importance of integrating emotional aspects, such as consumer happiness, into the traditional TPB constructs. Conversely, a study by Xu et al. (2022) in China, with a sample of 516 participants, found that perceived environmental risk and social responsibility carry greater weight than happiness as determinants of purchase intention, suggesting that these contextual variables may have a differential impact depending on the cultural setting.

2.3 Theory of planned behaviour (TPB) model

The Theory of Planned Behaviour (TPB), developed by Ajzen (1991), has become a well-established theoretical framework in academia for analysing and predicting behavioural intentions across various scenarios (Ali et al., 2023). This theory includes fundamental variables such as attitudes, subjective norms, and perceived behavioural control, which interact to explain the intention to perform a specific behaviour (Correia et al., 2021). Its relevance extends to multiple areas, including sustainable consumption, physical activity, technology adoption, and pro-environmental behaviour (Yuriev et al., 2020). In the realm of sustainable consumption, it has been



used to analyse how attitudes, subjective norms, and perceived control influence the intention to purchase eco-friendly products (Mendoza et al., 2021). Thus, studying these variables becomes particularly significant in educational and consumer contexts, especially within a generation that prioritises social and environmental responsibility (Gómez-Mazorra et al., 2021).

The model includes the following variables:

2.3.1 Attitude

Currently, attitudes toward sustainable consumption have gained significant relevance in consumer behaviour studies, particularly among Generation Z youth (Mendoza et al., 2021). Attitude refers to an individual's favourable or unfavourable predisposition toward an object, person, or specific behaviour, in this case, the consumption of products with sustainable packaging (Ajzen, 1991). This concept has transcended theoretical analysis to become an indispensable tool in promoting pro-environmental behaviours, as it reflects consumers' valuation and commitment to sustainability (Saut & Saing, 2021). In a global context of concern over the environmental crisis, investigating young people's attitudes toward sustainable products is essential. Variables such as subjective norms, perceived behavioural control, and receptiveness to green advertising have been shown to influence attitudes and purchase intentions (Armutcu & Tan, 2023).

2.3.2 Subjective norms

Subjective norm has gained relevance in consumer behaviour studies, particularly within the framework of the TPB, where it is defined as the perceived social pressure to engage or not engage in a specific behaviour (Ajzen, 1991). This concept has transcended the realm of psychological theory, integrating into the study of sustainability, as many young consumers report that their purchasing decisions are influenced by social expectations and collective values (Lavuri, 2021). In a global context, where sustainability and environmental awareness have become more prominent, subjective norm is a determining factor in the purchase intention of sustainable products (Saut & Saing, 2021).

Academic research on subjective norm within the TPB framework has highlighted its role in the formation of pro-environmental attitudes and behaviours (Correia et al., 2021). In particular, it has been observed that subjective norm can act as a motivational factor for young consumers, who perceive that their purchasing decisions contribute to a greater cause, such as environmental

preservation (Qazi et al., 2023). However, there are contradictory results regarding its impact; for example, the study by Vlastelica, Kostić-Stanković, Krstić, and Rajić (2023) suggests that while subjective norm influences purchase intention, its effect is less significant compared to other factors, such as attitude or perceived behavioural control.

2.3.3 Perceived behavioural control

Perceived behavioural control has been established as a key element of the TPB and refers to an individual's perception of how easy or difficult it would be to perform a given action. (Ajzen, 1991). This concept has gained significant relevance in the context of sustainability, particularly among Generation Z consumers, who consider factors such as the accessibility and cost of eco-friendly products when deciding to make pro-environmental purchases (Mison et al., 2023). The importance of perceived behavioural control lies in its ability to provide a better understanding of how perceived barriers affect purchasing behaviour and what strategies might help overcome them (Dorce et al., 2021).

Thus, the study of the Theory of Planned Behaviour (TPB) in relation to purchase intention has intensified due to its ability to explain and predict behaviours across diverse contexts, including those related to sustainability (Ruangkanjanases et al., 2020). In this regard, Dorce et al. (2021), emphasise that perceived behavioural control is especially relevant in the context of organic products, because it helps to overcome barriers such as price or availability, highlighting its role in strengthening purchase intention.

Moreover, prominent researchers like Zhang et al. (2022) have demonstrated that the TPB is enhanced when emotional variables, such as consumer happiness, are incorporated to explain pro-environmental behaviours. Their study, conducted in the contexts of Pakistan and Malaysia, revealed that happiness acts as a mediator, intensifying the relationship between positive attitudes and the intention to purchase recyclable products.

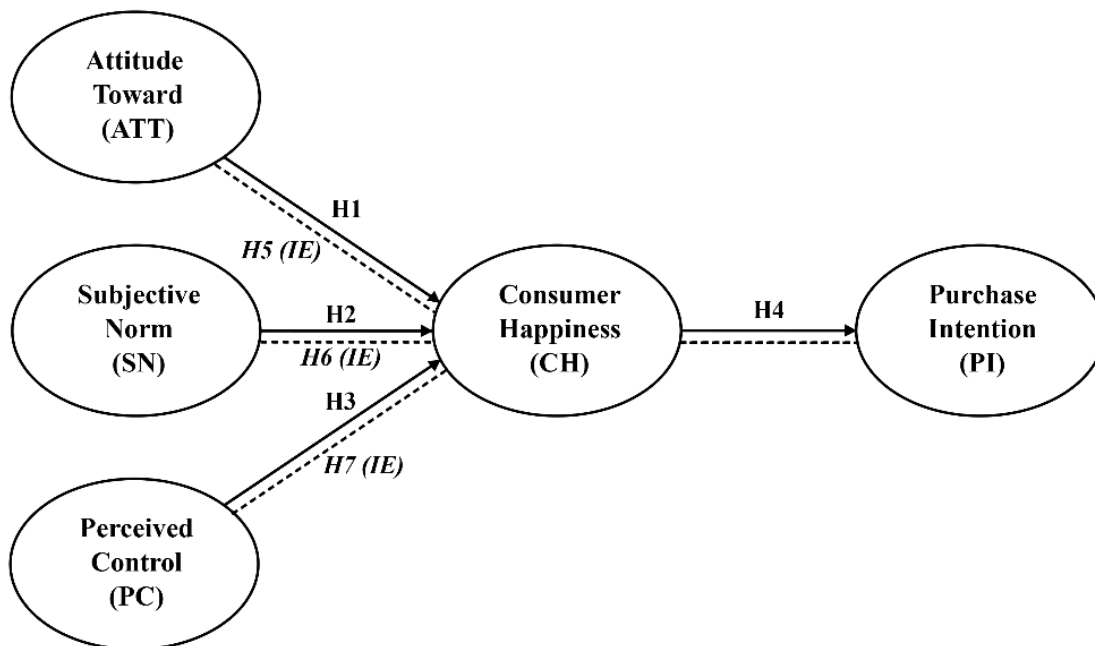
Therefore, the present study aims to expand the Theory of Planned Behaviour (TPB) by analysing the interaction among attitude, subjective norms, and perceived behavioural control, and their influence on the intention to purchase sustainable products among centennials. Furthermore, it seeks to innovate by incorporating consumer happiness as a mediating variable, providing deeper insights into its role within the relationship between TPB constructs and purchase intention.

Based on these arguments, the following hypotheses are proposed.

- H1: Attitude has a positive and significant effect on consumer happiness among the centennial generation.*
- H2: Subjective norms have a positive and significant effect on consumer happiness among the centennial generation.*
- H3: Perceived behavioural control has a positive and significant effect on consumer happiness among the centennial generation.*
- H4: Consumer happiness has a positive and significant effect on purchase intention among the centennial generation.*
- H5: Consumer happiness mediates the relationship between attitude and purchase intention among the centennial generation.*
- H6: Consumer happiness mediates the relationship between subjective norms and purchase intention among the centennial generation.*
- H7: Consumer happiness mediates the relationship between perceived behavioural control and purchase intention among the centennial generation.*

Figure 1

Proposed model



Source: Own elaboration.

3 Methodology

3.1 Participants and procedure

This research adopted a quantitative, non-experimental, cross-sectional design to analyse the characteristics and behaviours of university-educated centennials in relation to their habits and attitudes. Data were collected during October 2024 through a structured questionnaire administered digitally to a non-probabilistic sample of 390 university students. The choice of an online format enabled efficient access to a young population highly accustomed to using digital platforms.

Participation was entirely voluntary, and confidentiality and anonymity of responses were ensured. The questionnaire included questions on sociodemographic variables (age, gender, marital status, and employment status) and aspects related to the specific objectives of the research, designed to capture relevant information about the perceptions and behaviours of this generation.

Regarding the descriptive characteristics of the sample, female participants represented 64.87% of the total, followed by males at 34.36%, while 0.77% preferred not to specify their gender. Most respondents (69.23%) were full-time students, while 30.77% combined their studies with employment. Concerning marital status, 96.41% identified as single, 1.03% as married, and 2.56% as in a domestic partnership. The age range was between 18 and 25 years, with a mean age of 19.9 years, reflecting a relevant segment and providing a solid foundation for analysing the trends and behaviours of the centennial generation.

3.2 Instruments

The data collection instrument was a structured questionnaire with 5-point Likert scales, where participants rated their level of agreement or disagreement with statements related to the study variables: attitude toward sustainable packaging, subjective norms, perceived control, purchase intention for sustainable packaging products, and consumer happiness. This format was selected for its ease of application and comprehension, facilitating the collection of clear and reliable data.

Attitude toward sustainable packaging was measured using three items adapted from Maichum, Parichatnon, and Peng (2016), which assessed positive perceptions of the environmental impact of sustainable packaging. Subjective norms were evaluated with three items also based on

Maichum et al. (2016), exploring the perceived social influence to consume products with sustainable packaging. Similarly, perceived control was measured with five items adapted from the same authors, focusing on the perceived ease of accessing sustainable packaging products in everyday consumer contexts.

Purchase intention for sustainable packaging products was assessed with three items designed to measure participants' predisposition to purchase such products in the future, also adapted from Maichum et al. (2016). Finally, consumer happiness was measured using four items adapted from Cuesta-Valiño, Gutiérrez-Rodríguez, and Contreras-Contreras (2023), which analysed perceived well-being and satisfaction when consuming environmentally responsible products. A detailed list of the questionnaire items is provided in the Appendix.

3.3 Data analysis technique

To analyse the relationships among the variables of attitude toward sustainable packaging, subjective norms, perceived control, purchase intention for sustainable packaging products, and consumer happiness, the Jamovi software (version 2.3.28) was utilised. The analysis began with a univariate exploration of the variables, calculating measures of central tendency (mean and standard deviation) and assessing data distribution through skewness and kurtosis indices. This initial step ensured data quality and verified compliance with the assumptions necessary for subsequent analyses.

Structural Equation Modelling based on covariances (CB-SEM) was then employed to validate the theoretical model. This approach was selected due to its suitability for theory testing and model confirmation, particularly when the research is grounded in a well-established theoretical framework such as the TPB. Convergent validity was confirmed through the calculation of the Average Variance Extracted (AVE), Composite Reliability Index (CRI), and Cronbach's Alpha, ensuring the internal consistency of the constructs. Discriminant validity was primarily assessed using the Fornell-Larcker criterion and additionally supported by the Heterotrait-Monotrait Ratio (HTMT), as a complementary measure to further confirm construct distinctiveness. The structural model's fit was evaluated using indices such as the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Chi-Square Normalised Index (χ^2/df), confirming the robustness and validity of the proposed model.

4 Results and Discussions

4.1 Exploratory factor Analysis (EFA)

An Exploratory Factor Analysis (EFA) was conducted to evaluate the validity and reliability of the constructs associated with the studied variables: attitude toward sustainable packaging, subjective norms, perceived control, purchase intention for sustainable packaging products, and consumer happiness. This analysis included the assessment of item correlations, communalities, and statistical tests such as the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity. The results indicate that the data meet the construct validity conditions, confirming that the instrument used is appropriate for measuring the proposed dimensions (see Table 1).

Table 1

Exploratory factor analysis

Variable	Attitude	Subjective Norm	Perceived Control	Consumer Happiness	Purchase Intention
Correlations between items	0.632 <-> 0.745	0.673 <-> 0.739	0.395 <-> 0.678	0.614 <-> 0.770	0.673 <-> 0.764
Level of correlations	High	High	Moderate	High	High
Significance	0.000	0.000	0.000	0.000	0.000
Determinant	0.211	0.077	0.175	0.074	0.193
Communalities	0.759 <-> 0.844	0.794 <-> 0.843	0.517 <-> 0.633	0.683 <-> 0.814	0.769 <-> 0.839
Level of communalities	Adequate	Adequate	Adequate	Adequate	Adequate
KMO Test	0.724	0.738	0.785	0.807	0.736
Barlett's test	0.000	0.000	0.000	0.000	0.000
Total variance explained	79.71%	81.09%	58.23%	77.04%	80.87%

Source: Own elaboration.

Firstly, the correlations between items were significant ($p < 0.001$) and ranged from moderate to high, supporting the internal consistency of the items within each construct. The Kaiser-Meyer-Olkin (KMO) test values ranged between 0.724 and 0.807, exceeding the minimum acceptable threshold of 0.6 as per Field (2013), indicating adequate suitability for factor analysis.

Similarly, Bartlett's test of sphericity was significant ($p < 0.001$) for all variables, confirming the appropriateness of the factor model for the analysed data.

Finally, communalities were within acceptable ranges, and the total variance explained for each construct exceeded 60%, with the exception of perceived control, which reached 58.23%. Although some authors suggest a threshold of 60% for construct validity, values close to this are acceptable, particularly when other indicators, such as KMO and communalities, are adequate. In this case, the overall results support the validity and reliability of the instrument, ensuring that the selected items representatively capture the proposed theoretical dimensions.

4.2 Correlational analysis

The results of the Pearson correlation analysis, presented in Table 2, show positive and significant relationships among the studied variables: attitude toward sustainable packaging, subjective norms, perceived control, consumer happiness, and purchase intention. Attitude toward sustainable packaging demonstrates significant correlations with all other variables, particularly with subjective norms ($r = 0.667$, $p < 0.001$), perceived control ($r = 0.672$, $p < 0.001$), and consumer happiness ($r = 0.671$, $p < 0.001$). Additionally, purchase intention is significantly related to attitude ($r = 0.617$, $p < 0.001$), emphasising its importance within the model.

Moreover, consumer happiness exhibits the highest correlation with purchase intention ($r = 0.692$, $p < 0.001$), highlighting its pivotal role in the model. Similarly, the relationships between subjective norms and perceived control ($r = 0.616$, $p < 0.001$) and between perceived control and consumer happiness ($r = 0.618$, $p < 0.001$) reinforce the interconnectedness of these variables. These results empirically support the study's hypotheses, indicating that perceptions and attitudes toward sustainable packaging are closely linked to purchase intention.

Table 2

Correlations between variables

Variables	Attitude	Subjective Norm	Perceived Control	Consumer Happiness	Purchase Intention
Attitude					
Subjective Norm	0.667*				
Perceived Control	0.672*	0.616*			
Consumer Happiness	0.671*	0.668*	0.618*		
Purchase Intention	0.617*	0.615*	0.569*	0.692*	

Note. *p<0.001

Source: Own elaboration.

4.3 Structural equation model

The analysis was conducted using Jamovi software, which evaluated the model fit and construct validity through Structural Equation Modelling (SEM). This approach enabled a detailed examination of the relationships among attitude toward sustainable packaging, subjective norms, perceived control, consumer happiness, and purchase intention, providing a comprehensive understanding of the interactions and dynamics among these variables within the theoretical model.

4.3.1 Model validity

The validity of the measurement model was assessed using indicators of convergent and discriminant validity, following the methodological guidelines of Hair, Hult, Ringle, and Sarstedt (2014). Initially, factor loadings, Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) were analysed for each construct. The results are detailed in Table 3.

Regarding the factor loadings, these should exceed 0.7 to ensure that the items explain at least 50% of the variance of the construct. In this analysis, all factor loadings met this criterion except for item PBC3 of the perceived control construct, which achieved a loading of 0.658. Despite not reaching the recommended threshold, this item was retained to ensure a minimum of three items within the construct, as suggested by Hair et al. (2014). Additionally, two items with insufficient factor loadings were removed. This decision did not compromise internal reliability indicators, as Cronbach's Alpha (0.760), Composite Reliability (CR) (0.834), and Average



Variance Extracted (AVE) (0.623) for perceived control remained within acceptable ranges, supporting convergent validity.

In general, the results show that the evaluated constructs are valid and reliable. All Cronbach's Alpha values exceeded 0.7, the composite reliability coefficients (CR) were above 0.7, and the AVE values were greater than 0.5, indicating that the items explain a significant proportion of the variance in the constructs (Hair et al., 2017). This ensures that the measurement model is suitable for analysing the relationships between the variables in the structural model.

The discriminant validity of the model was assessed using the Fornell-Larcker criterion, with the results presented in Table 3. According to this criterion, the square root of the AVE (displayed on the diagonal of the matrix) for each construct should be greater than the correlations between them. This confirms that each construct is adequately differentiated from the others (Fornell & Larcker, 1981). These results validate that the constructs in the model are conceptually distinct and that the model satisfies the requirements for discriminant validity.

Table 3

Validity of the measurement model

Variable	Item	Factor loading	Cronbach's Alpha	IFC	AVE
Attitude	ATT1	0.779	0.87	0.875	0.694
	ATT2	0.896			
	ATT3	0.832			
Subjective Norm	SN1	0.823	0.883	0.884	0.718
	SN2	0.844			
	SN3	0.874			
Perceived Control	PBC2	0.859	0.76	0.834	0.623
	PBC3	0.658			
	PBC4	0.847			
Consumer Happiness	HC1	0.799	0.9	0.902	0.699
	HC2	0.866			
	HC3	0.858			
	HC4	0.814			
Purchase Intention	PI1	0.839	0.882	0.883	0.717
	PI2	0.875			
	PI3	0.824			

Discriminant validity						
Fornell-Larcker Criterion						
		1	2	3	4	5
1	Attitude	0.938				
2	Subjective Norm	0.667	0.952			
3	Perceived Control	0.672	0.615	0.945		
4	Consumer Happiness	0.671	0.668	0.618	0.888	
5	Purchase Intention	0.617	0.615	0.569	0.692	0.888

Source: Own elaboration.

4.3.2 Fit indices

The structural model's fit was evaluated using absolute, incremental, and parsimonious fit indices, with the results summarised in Table 4. For absolute fit, the CMIN (Chi-square) value was 346, which is acceptable in relation to the degrees of freedom. However, the associated p-value was 0.001, indicating marginal fit as it does not meet the criterion of $p > 0.05$. This result is expected in structural models with large sample sizes due to the sensitivity of the Chi-square test to sample size (Bollen, 1989). Additionally, the SRMR achieved a value of 0.046, within the acceptable range (< 0.08), indicating good agreement between the observed and predicted matrices (Hu & Bentler, 1999). On the other hand, the RMSEA reported a value of 0.083, suggesting marginal fit as it is slightly above the accepted threshold of 0.08 (Browne & Cudeck, 1992).



Regarding the incremental fit indices, the model demonstrated satisfactory values for the CFI (0.945), IFI (0.930), and TLI (0.945), all exceeding the minimum threshold of 0.900, indicating an adequate fit (Hu & Bentler, 1999). Finally, the PGFI, used to evaluate the model's parsimonious fit, achieved a value of 0.602, within the acceptable range (0.500 to 0.800). This suggests that the model is sufficiently simple to represent the data without the risk of overfitting (Mulaik et al., 1989). Together, these indices support the structural model's adequacy, confirming its suitability for analysing the proposed relationships among the study variables.

Table 4

Measures of fit

Type fit	Fit measurements	Acceptable levels	Model results	Acceptability
Absolute or global	CMIN	CMIN = 2 x GL	346	Acceptable
	P value	> 0.05	0.001	Marginal
	SRMR	< 0.08	0.046	Acceptable
	RMSEA	< 0.08	0.083	Marginal
Incremental	CFI	> 0.900	0.945	Acceptable
	IFI	> 0.900	0.930	Acceptable
	TLI	> 0.900	0.945	Acceptable
Parsimony	PGFI	0.500 > 0.800	0.602	Acceptable

Source: Own elaboration.

4.3.3 Hypothesis testing

The direct and indirect effects among the studied variables were evaluated to analyse the relationships proposed in the hypotheses. The results of the structural analysis are presented in Table 5 and show that all direct and indirect effects were significant, supporting the proposed hypotheses.

In the direct effects, it was observed that attitude toward sustainable packaging (ATT) has a significant and positive influence on consumer happiness (CH) ($\beta = 0.339$, $p < 0.001$), as do subjective norms (SN) ($\beta = 0.306$, $p < 0.001$) and perceived control (PC) ($\beta = 0.228$, $p < 0.001$). Furthermore, consumer happiness (CH) exhibited a positive and significant effect on purchase intention (PI) ($\beta = 0.958$, $p < 0.001$), which is the highest coefficient in the model. This suggests



that happiness is a relevant mediator in the relationship between antecedent variables and purchase intention.

Regarding the indirect effects, attitude toward sustainable packaging (ATT), subjective norms (SN), and perceived control (PC) significantly influence purchase intention (PI) through consumer happiness (CH). The indirect coefficients were $\beta = 0.324$ ($p < 0.001$) for ATT, $\beta = 0.293$ ($p < 0.001$) for SN, and $\beta = 0.218$ ($p < 0.001$) for PC, indicating that the mediation of consumer happiness is crucial for explaining the impact of these variables on purchase intention. These results emphasise the importance of considering consumer happiness as a central mediator in the proposed model.

Table 5

Hypothesis testing

Hypothesis	Variables	Influence	S.E.	C.R.	P	Contrast
H1	CH <--- ATT	0.339	0.0705	4.80	***	Not rejected
H2	CH <--- SN	0.306	0.0610	5.02	***	Not rejected
H3	CH <--- PC	0.228	0.0604	3.78	***	Not rejected
H4	PI <--- CH	0.958	0.0530	18.05	***	Not rejected
Indirect effect						
H5	PI <--- CH <--- ATT	0.324	0.068	4.77	***	Not rejected
H6	PI <--- CH <--- SN	0.293	0.059	4.99	***	Not rejected
H7	PI <--- CH <--- PC	0.218	0.058	3.76	***	Not rejected

Note. *** $p < 0.001$

Source: Own elaboration.

Figure 2 presents the developed structural model, which illustrates the relationships among the variables: attitude toward sustainable packaging, subjective norms, perceived control, consumer happiness, and purchase intention. The arrows represent both direct and indirect effects, highlighting the mediating role of consumer happiness in the relationship between antecedent variables and purchase intention. This model provides a visual representation of how these variables collectively influence sustainable purchasing decisions.

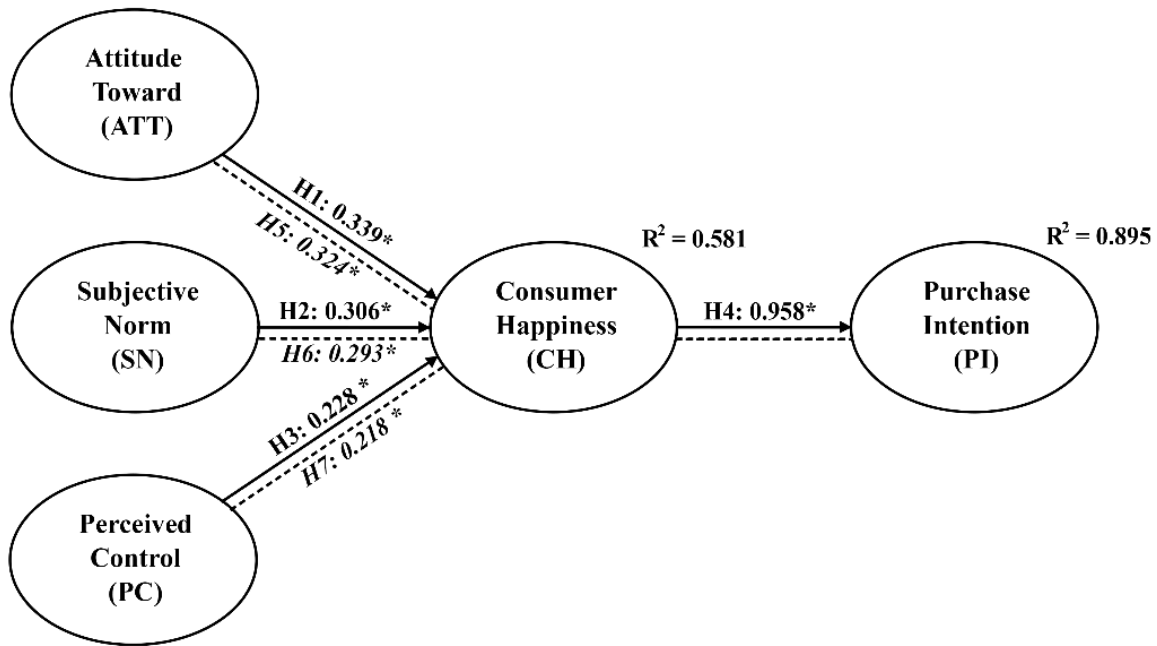
The R^2 values obtained reflect a significant proportion of variability explained in the dependent variables. For purchase intention ($R^2 = 0.895$), the model achieves a high level of explained variance, while for consumer happiness ($R^2 = 0.581$), the result is close to the 0.67 threshold, which is considered high according to Chin (1998). These results highlight the role of



consumer happiness as a mediator, connecting initial perceptions and attitudes to purchase intention, establishing itself as a key factor in understanding sustainable purchasing behaviours.

Figure 2

Structural model



Note. *p<0.001

Source: Own elaboration.

4.4 Discussions

The results of this study shed light on the dynamics between the variables of the Theory of Planned Behaviour (TPB) and consumer happiness in the context of purchase intention for sustainable packaging among centennials, an important generation given their environmental awareness and ethical values (Djafarova & Foots, 2022; Triquet, 2020). Firstly, the findings for H1 confirm that attitudes toward sustainable packaging have a significant and positive effect on consumer happiness ($\beta = 0.339$, $p < 0.001$). This result aligns with previous research highlighting that positive attitudes toward sustainable behaviours generate positive emotions, such as happiness, as they align with ethical and pro-environmental values (Zhang et al., 2022). For centennials, this relationship is particularly significant, as sustainable packaging represents not just

a functional product but also a symbol of their ideals and commitment to sustainability (Song et al., 2020).

Regarding H2, the results showed that subjective norms also have a positive and significant effect on consumer happiness ($\beta = 0.306$, $p < 0.001$), reinforcing the importance of social influences in sustainable purchasing decisions (Lavuri, 2021; Qazi et al., 2023). Centennials, being sensitive to peer expectations, perceive greater emotional well-being when meeting these expectations, which strengthens their commitment to pro-environmental practices (Misron et al., 2023). Similarly, H3 confirms that perceived control positively influences consumer happiness ($\beta = 0.228$, $p < 0.001$). This finding aligns with studies that emphasise how the perception of ease or ability to consume sustainable products contributes not only to purchase intention but also to the consumer's emotional well-being, by overcoming perceived barriers such as cost or accessibility (Correia et al., 2021; Dorce et al., 2021).

Consumer happiness, as evaluated in H4, was established as a mediator in the model, demonstrating a significant impact on purchase intention ($\beta = 0.958$, $p < 0.001$), which from a theoretical perspective provides an extension of the traditional TPB, primarily grounded in cognitive determinants. This result supports research that emphasises how positive emotions amplify the relationship between ethical values and sustainable purchasing decisions (Cachero-Martínez, 2020; Lisboa et al., 2022), suggesting that consumer happiness functions as an affective mechanism through which these cognitive evaluations are translated into purchase intention.

At the same time, the magnitude of this coefficient suggests that the relationship should be interpreted with caution, as its strength may reflect not only the theoretical linkage between emotional satisfaction and behavioural predisposition in sustainable consumption, but also the characteristics of a cross-sectional, self-reported, and relatively homogeneous sample. In this sense, sustainable packaging not only meets a functional need but also generates well-being by reinforcing consumers' personal and social values (Armutcu & Tan, 2023; Guevara & Aldana, 2023), highlighting the importance of integrating emotional aspects, such as happiness, into both marketing strategies and theoretical models, and offering a more comprehensive explanation of sustainable consumption behaviour.

On the other hand, the indirect effects, analysed in hypotheses H5, H6, and H7, show that consumer happiness mediated the relationships between attitude, subjective norms, and perceived control with purchase intention. The observed mediation was significant for all relationships, with

coefficients of $\beta = 0.324$ ($p < 0.001$) for attitude, $\beta = 0.293$ ($p < 0.001$) for subjective norms, and $\beta = 0.218$ ($p < 0.001$) for perceived control. These results confirm that consumer happiness acts as a bridge that amplifies the effects of TPB variables on purchase intention, reinforcing consumers' commitment to sustainable practices. This aligns with studies such as those by Misron et al. (2023) and Zhang et al. (2022), which highlight the importance of positive emotions in fostering pro-environmental behaviours. Specifically, consumer happiness as a mediator provides a comprehensive approach that emphasises both the functional and emotional benefits of sustainable products.

These findings not only reinforce the utility of TPB constructs in explaining the purchase intention of sustainable packaging but also show that incorporating consumer happiness enhances the model by capturing the emotional dimension of decision-making. The ability of sustainable packaging to generate emotional well-being underscores its relevance as a marketing tool, particularly among centennials, who value both the functional and emotional benefits of products aligned with their values. Businesses aiming to attract this segment should focus on highlighting the emotional benefits of sustainable packaging, linking them to the satisfaction and happiness derived from consuming such products.

From a broader analytical perspective, these findings also contribute to understanding the scope and applicability of the proposed model. The use of covariance-based structural equation modelling within a cross-sectional design supports robust theory testing and highlights the strength of the relationships among the TPB variables and consumer happiness. At the same time, this modelling approach reflects how perceptual and self-reported constructs interact within a specific context, positioning the extended TPB as particularly suitable for explaining sustainable consumption behaviour among university-educated centennials. In this sense, the model offers a context-sensitive explanation of purchase intention, capturing both cognitive and affective dimensions of decision-making within this population, while its explanatory scope should be understood as bounded by these contextual and methodological conditions.

5 Conclusions

5.1 Summary of results

The analysis confirms that, within the context of university-educated centennials, consumer happiness plays a central role in the purchase intention for sustainable packaging, acting as a



mediator in the relationships between the variables of the Theory of Planned Behaviour (TPB). Firstly, attitudes toward sustainable packaging were found to have a positive and significant impact on consumer happiness, highlighting that consumers experience greater emotional well-being when their purchasing decisions reflect ethical and pro-environmental values. Similarly, subjective norms showed a significant positive influence, emphasising that social expectations and the approval of their environment enhance the emotional well-being of centennials. Perceived control, although with a more moderate effect, also contributed to consumer happiness, demonstrating that the perception of ease in consuming sustainable products increases personal satisfaction by overcoming perceived barriers.

Moreover, the results revealed that consumer happiness is not merely an emotional outcome of sustainable consumption but also acts as a driving factor that intensifies purchase intention. This finding reinforces the notion that sustainable packaging not only serves a practical function but also symbolises an ethical and environmental commitment, enhancing consumers' sense of purpose and personal satisfaction. In this regard, consumer happiness amplifies the relationships between attitudes, subjective norms, and perceived control with purchase intention, positioning it as an essential dimension for explaining sustainable behaviour. This perspective highlights the importance of designing marketing strategies that not only communicate the functional benefits of sustainable packaging but also emphasise its emotional benefits, connecting with centennials' values and aspirations while enhancing their emotional well-being. These findings should be interpreted considering the specific characteristics of the sample analysed.

5.2 Theoretical contributions

The theoretical contributions of this research expand and enrich Ajzen's (1991) Theory of Planned Behaviour (TPB) by integrating consumer happiness as a mediator between attitudes, subjective norms, perceived control, and the purchase intention for sustainable packaging. This study posits that consumer happiness is not merely an outcome of sustainable purchasing decisions but an essential component that amplifies the relationships among TPB variables. In doing so, this research broadens the scope of the TPB by highlighting the importance of positive emotions as a driving force that enhances pro-environmental behaviour.

In contrast to the traditional TPB, which primarily explains behaviour through cognitive determinants, the proposed model incorporates an affective mechanism that improves the

understanding of how these determinants are translated into purchase intention. Building on this, a key contribution is the incorporation of consumer happiness as a mediating construct within the TPB framework, providing a comprehensive perspective on how sustainable purchasing decisions are profoundly influenced by emotional factors. This approach strengthens the theory by demonstrating that consumers are not only driven by beliefs, social norms, and perceived control but also seek emotional gratification by aligning their choices with ethical and pro-environmental values. This finding connects with the growing body of literature linking subjective well-being to sustainable consumption behaviours, offering a more robust theoretical framework to understand the motivations of younger generations, such as centennials.

Moreover, this research highlights that consumer happiness can serve as a bridge between the functional and emotional benefits of sustainable packaging. By positioning happiness as a central factor in purchasing decisions, the study introduces an emotional dimension to traditional consumer behaviour models, offering new perspectives for the design of marketing strategies. This theoretical approach not only contributes to academic understanding but also presents practical implications for businesses aiming to connect emotionally with conscious consumers, validating the importance of emotions as determinants of purchase intention.

5.3 Practical implications

The practical implications of this study provide clear guidance for companies and organisations aiming to promote sustainable consumption through responsible packaging, particularly when targeting the centennial generation. Firstly, the findings emphasise the importance of highlighting not only the functional benefits of sustainable packaging but also its ability to generate positive emotions, such as consumer happiness. Marketing strategies should focus on showcasing how these products enable consumers to align their decisions with ethical and pro-environmental values, reinforcing their sense of purpose and commitment to the environment.

Another important aspect is the role of consumer happiness as a mediator between attitudes, subjective norms, and perceived control in purchase intention. Companies can leverage this finding by implementing campaigns that highlight the emotional experiences associated with sustainable packaging, such as the satisfaction of contributing to the planet's well-being or the pride of



supporting responsible initiatives. This approach is particularly effective in capturing the attention of centennials, who value authenticity and brand alignment with their ethical principles.

Finally, organisations must recognise that consumer happiness is not just an outcome but a strategic objective to build loyalty and commitment toward sustainable brands. By fostering emotional connections through narratives that emphasise the positive impact of sustainable packaging on the environment and society, companies can differentiate themselves in a competitive market. Moreover, by facilitating access to and providing information about these products, brands can reduce perceived barriers such as cost or availability, thereby maximising both purchase intention and consumers' emotional satisfaction.

5.4 Limitations and future research directions

This study provides significant insights into the relationship between the variables of the Theory of Planned Behaviour (TPB), consumer happiness, and purchase intention for sustainable packaging. However, it also presents certain limitations that should be considered. Firstly, the research employed a cross-sectional design, which restricts the possibility of determining conclusive causal relationships between the variables studied. Future studies could adopt longitudinal designs to examine how attitudes, happiness, and sustainable purchase intentions evolve over time, particularly in light of transformations in centennials' behaviour due to social or economic changes.

Another limitation lies in the geographical and demographic context of the study, which focused exclusively on university-educated centennials. In particular, this sample may be characterised by a relatively homogeneous socioeconomic background, higher levels of education, and greater exposure to pro-sustainability discourses, which could introduce potential biases such as social desirability. These factors may lead to an overestimation of pro-environmental attitudes, consumer happiness, and purchase intention. Additionally, these conditions may contribute to strengthening some of the structural relationships observed in the model.

Future research could expand the sample to include different regions and generations to examine how cultural and sociodemographic differences affect these relationships. Additionally, exploring contextual factors such as local environmental policies or sustainable marketing campaigns could provide insight into how these elements influence purchase intention. Therefore,



the findings of this study should be interpreted within the specific context of university-educated centennials.

Regarding future research directions, incorporating new constructs into the TPB framework is recommended to enhance its explanatory power. Variables such as environmental knowledge, green trust, and moral obligation could provide a more comprehensive perspective on the factors influencing sustainable consumption decisions.

Authors' contribution - Contributor Roles Taxonomy

Contribution	Hernández-Arteaga, L. G.	Martínez-Arvizu, O. J.	Salazar-Altamirano, M. A.	Galván-Vela, E.	Ochoa-Hernández, m. l.
Conceptualization	X		X	X	X
Methodology	X	X	X	X	X
Software		X	X		
Validation	X	X		X	
Formal analysis	X	X	X	X	
Investigation	X	X	X	X	X
Resources	X		X		X
Data Curation		X	X		
Writing - Original Draft	X	X	X	X	X
Writing - Review & Editing	X	X	X	X	X
Visualization	X	X	X	X	X
Supervision	X	X	X	X	X
Project administration	X	X	X	X	X
Funding acquisition					

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APPENDIX

Constructs and indicators

Construct	Code	Indicator	Authors
Attitude	ATT1	I consider buying products with sustainable packaging as favorable.	Adapted from Maichum et al. (2016).
	ATT2	I consider buying a product with sustainable packaging a good idea.	
	ATT3	I consider buying a product with sustainable packaging as safe.	
Subjective Norm	SN1	My family thinks I should buy products with sustainable packaging.	Adapted from Maichum et al. (2016).
	SN2	My close friends think I should buy products with sustainable packaging.	
	SN3	Most of the people who are important to me think I should buy products with sustainable packaging.	
Perceived Control	PBC1	I am confident that I can buy products with sustainable packaging whenever I want.	Adapted from Maichum et al. (2016).
	PBC2	I feel prepared to buy products with sustainable packaging in the future.	
	PBC3	I have the resources, time, and availability to buy products with sustainable packaging.	
	PBC4	I have many opportunities to buy products with sustainable packaging.	
	PBC5	The decision to buy products with sustainable packaging is completely up to me.	
Consumer Happiness	HC1	I am satisfied with my decision to buy products with sustainable packaging.	Adapted from Cuesta-Valiño et al. (2023).
	HC2	Buying products with sustainable packaging is rewarding for me.	
	HC3	Buying products with sustainable packaging contributes to my overall happiness in life.	
	HC4	Buying products with sustainable packaging genuinely improves the quality of my life.	
Purchase Intention	PI1	I intend to buy a product with sustainable packaging on my next purchase due to its positive contribution to environmental protection.	Adapted from Maichum et al. (2016).
	PI2	I intend to buy more products with sustainable packaging than conventional ones.	
	PI3	I would consider replacing my purchases with sustainably packaged products for ecological reasons.	

