Sustainable food packaging: Factors affecting consumer purchase intention

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Abstract
Food packaging is the top plastic polluter in the Asia Pacific Region. Therefore, consumer purchase of food in sustainable packaging can reduce the use of plastic. The purpose of this study is to examine the factors that affect consumer purchase intention of sustainable food packaging based on the Theory of Planned Behaviour. The study employed a sample of 200 food consumers. Using multiple regression analysis, the results found (i) attitude, (ii) perceived behavioural control, (iii) environment concern and (iv) electronic word of mouth to be significant antecedents of sustainable food packaging consumer purchase intention. This study enlarges the understanding of the market acceptance of sustainable food packaging.

Keywords: TPB, Environment Concern, Sustainability, Food Packaging.

Introduction
Research Background
One of the crucial components of the food business is its packaging. This is because attractive and safe food packaging gives consumers peace of mind. The type of packaging is also a medium for communication between the company and the consumers, which is able to attract the consumer's attention. However, the food packaging must also be environmentally friendly in addition to protecting the goods since the current condition emphasises environmental preservation. In ancient times, people ate what they got from the natural environment without considering the storage of food. Food packaging and storage technology began to slowly develop when people realised the importance of storing food. The concept of protecting food has gradually appeared and increased in people's thoughts. After more than 150 years of changes in food packaging, there are now various forms, such as single-use plastic packaging (Sarkar and Aparna, 2020).

From 2018 to 2022, as many as 20,786 plastic pollutants have been collected in Malaysia. There are 10,035 food packaging, 2,389 smoking materials, and 6,201 other plastic products that have been found. This data shows that food packaging is the largest contributor to plastic waste. The recent data also show that the most polluting company is Coca-Cola, which contributes 21.96% of plastic waste. This is followed by Chuan Sin Sdn Bhd and Cactus

Marketing Sdn Bhd, which contribute 13.15% and 12.87% respectively (Brand Audit Report, 2022). In addition, consumer needs for food packaging have changed dramatically in these few years due to the unlimited access to green information that available to consumers. Consumers are aware of the environmental impact of packaging and the waste of resources. Thus, they look for packaging that suits their wants, which is a sustainable food packaging product. As a result, food companies need to pay attention to consumers' preferences for environmentally friendly packaging products, while consumers who purchase food in sustainable packaging reduce the use of plastic.

Research Problems

Packaging is the largest contributor to global plastic waste, accounting for nearly 50% of the total plastic waste, and food packaging is estimated to be more than a third of the world's total packaging market (Ncube et al., 2021). This show that food packaging contributes heavily to plastic packaging waste. As mentioned above, 10,035 food packaging waste in Malaysia also shows that food packaging is the largest contributor to the total plastic waste. This situation happened because most of the food industry relies on the use of single-use plastic packaging. Consumers who buy plastic-wrapped food will throw away the plastic packaging, and it becomes post-consumer waste. These discarded plastics takes a long time to decompose and cause negative problems to the environment (Ncube et al., 2021).

In 2020, the sudden emergence and outbreak of COVID-19 disease around the world have negatively affected consumers in various aspects such as the demand for food (OECD, 2020). Consumers have increased the demand for non-perishable foods, including frozen and canned foods. 63% of the consumers have stocked up on frozen fast food such as nuggets, and 58% have stocked up on frozen meat during these time in Malaysia (CB Food, 2021). Likewise, weekly sales of frozen food in France increased as much as 63% from the year earlier (OECD, 2020). Most frozen food packaging is made from Polyethylene (PE) (Tyagi et al., 2021). These frozen food plastic packaging will increase the amount of plastic waste.

There is not much research that has been done on the topic of sustainable food packaging. The current literature did not adequately address this problem, which resulted in more food packaging becoming plastic waste. In order to reduce the plastic that are used in food packaging by food manufacturers, this research aims to recognise the social psychology of the consumer that affects the consumer's behaviour toward sustainable food packaging.

The research objectives of this study are to investigate the relationships between attitude, personal norms, perceived behavioural control, environmental concern, electronic word of mouth, and consumer purchase intention of sustainable food packaging. Specifically, the study aims to examine the extent to which each of these factors influences consumers' intention to purchase sustainable food packaging.

Justification or Significance of Research

This research will provide valuable contributions to the body of knowledge. The research framework incorporates additional variables that were not examined in other researchers' studies of the similar topic, namely environment concern and electronic word of mouth. The theoretical significance relates to how the environment concern provides an understanding of the degree to which consumers take care of the environment. This allows the food producer to

provide suitable packaging for them. Aside from that, electronic word of mouth provides an understanding of the degree to which consumers believe the review on the internet. As a result, this research has valuable theoretical implications that will help other researchers seeking to advance their knowledge of this field. This research also has managerial significance. It provides the food companies with a better understanding consumers' purchase intention related to sustainable food packaging. Food companies can learn about the preferences of consumers for food packaging, such as whether they prefer to buy food in sustainable packaging. Providing sustainable packaging benefits not only the environment but also enhances the company's reputation. The consumers will have a good impression of the company because sustainable food packaging from the provider shows the company is responsible and cares about the environment. Therefore, the managerial implication is that food company can redesign its food packaging to make it more sustainable and promote these efforts on social media through advertisements. The social significance of the research provides an understanding of the requirements and needs of consumers toward food packaging. The consumers need sustainable food packaging that can easily be disposed of. This is because sustainable food packaging is compostable or recyclable. Furthermore, this study provides an understanding of the characteristics of sustainable food packaging. Sustainable food packaging will not cause global warming and other environmental problems since it has less harmful plastic compared to single-use plastic packaging. Hence, the social implication is that consumers can recycle and reuse it and the government can hold the food companies accountable if they use bad materials in their food packaging.

Literature Review

The Theory of Planned Behaviour is developed by Ajzen (1985). It includes attitude, personal norms, and perceived behavioural control to understand and predict individual behaviour. This theory has been used by many researchers to study individual behaviour such as in the research on green products (Yadav and Pathak, 2016) or organic food (Scalco et al., 2017). Hence, this theory is suitable for this research, as it aims to know the behaviour of food consumers in purchasing sustainable food packaging. Since this theory is easily extended or modified (Ajzen, 1991), the recent research that uses this theory adds new related variables to increase the explanatory capability of the individual's behavioural intention (Chen and Hung, 2016). Hence, this research adds a new variable, which is an environment concern. The second theory that is used in this research is the Dual-Process Theory. This theory explains how informational and normative factors affect the credibility and persuasiveness of information (Deutsch and Gerard, 1955). This theory is suitable to use in this research because electronic word of mouth involves communication from various dynamic sources (Cheung and Thadani, 2012). The two-family model of this theory is the elaboration likelihood model (ELM) and the heuristic systemic model (HSM). Both models study the changes in social media user behaviour through different aspects of the information, such as the strength of the argument, and the credibility of the source.

Purchase Intention

Purchase intention is based on the brand's personal behaviour tendency or the individual's awareness of trying to buy the brand (Shabbir et al., 2009). Many new ideas on the market

offer more options to entice customers to voluntarily try and buy. In addition, purchases indicate a consumer's interest in or loyalty to a company or product. Furthermore, intention is a cognitive representation of a person's readiness to perform certain behaviours, and the best predictor of behaviour is intention (Shi et al., 2014). The stronger the intention that a consumer will perform a certain behaviour, the more likely it is to perform the desired behaviour (Ajzen, 1991).

Attitude

Attitude is a human tendency to react consistently to an object or action in a favourable or unfavourable way (Ajzen, 1989). Attitude influence consumers' willingness to buy sustainable food packaging, primarily because of the economic, psychological, anthropological, and marketing factors that influence attitudes. Attitude can predict a person's intention to behave in an environmentally friendly manner (Straughan and Roberts, 1999). This is because most people's behaviour is governed by their attitude. Attitude can be viewed as positive or negative customer opinions (Limbu et al., 2012). Therefore, the more positive attitude consumers have, the more likely they are to buy sustainably packaged food. Conversely, the more disapproving consumers are of sustainably packaged food, the more likely they are to stop buying it.

H1: There is a positive significant relationship between attitude and the consumer purchase intention of sustainable food packaging.

Personal Norms

Personal norms are the sense of moral obligation involving self-expectations of specific behaviours in specific situations (Schwartz, 1977). Ethical sourcing or responsible consumption behaviour is the result of consumers considering whether a product is harmful to society and adopting a responsible attitude in purchasing. Besides, the feeling of obligation caused by personal norms can drive people to purchase environmentally friendly products without carefully considering their personal benefit. Customers with strong personal norms are less likely to be constrained by higher prices or convenience and often focus on environmentally friendly production when making decisions (Thogersen, 1999).

H2: There is a positive significant relationship between personal norms and the consumer purchase intention of sustainable food packaging.

Perceived Behavioural Control

Perceived behavioural control is the perceived feasibility of performing a behaviour and relates to the resources and opportunities available to an individual (Dijst et al., 2008). Sustainable food packaging must provide these resources and opportunities to attract and retain customers. People are affected by factors such as knowledge, skills, time, and resources when engaging in intended behaviour (Goh et al. 2017). Factors such as cost and purchasing power also affect perceived behavioural control. A sustainable product is more expensive than a normal product. Hence, the consumer needs to pay more for it as the cost and price of sustainable food packaging increase. Therefore, consumers who have low purchasing power may not buy sustainable food packaging.

H3: There is a positive significant relationship between perceived behavioural control and the consumer purchase intention of sustainable food packaging.

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Environment concern

Environment concern is a person's awareness of environmental problems and willingness to solve them (Alibeli and Johnson, 2009). The occurrence of environmental problems means that the environment is in danger and consumers are limited to natural resources (Kalafatis, Pollard, East, and Tsogas, 1999). Therefore, consumers start to think about whether their actions will harm the environment in the decision-making process. The more people care about the environment, the more likely they are to buy sustainably packaged food. They are also more willing to pay more for it.

H4: There is a positive significant relationship between environment concern and the consumer purchase intention of sustainable food packaging.

Electronic word of mouth

Electronic word of mouth (eWOM) refers to any statement made by a customer about a product available on the internet that influences the purchase intention of other customers (Hennig, et al., 2004). Consumers rely on other customers' feedback on social networks, review sites, forums, and blogs to make informed purchasing decisions. These positive or negative reviews will influence other consumers' purchase intentions since they believe them. Hence, positive eWOM can increase consumers' trust in the company and its products, leading to a higher purchase intention, while negative eWOM has the opposite effect (Bailey, 2004). Sustainable food packaging with positive eWOM can attract environmentally friendly consumers and increase their purchase intention.

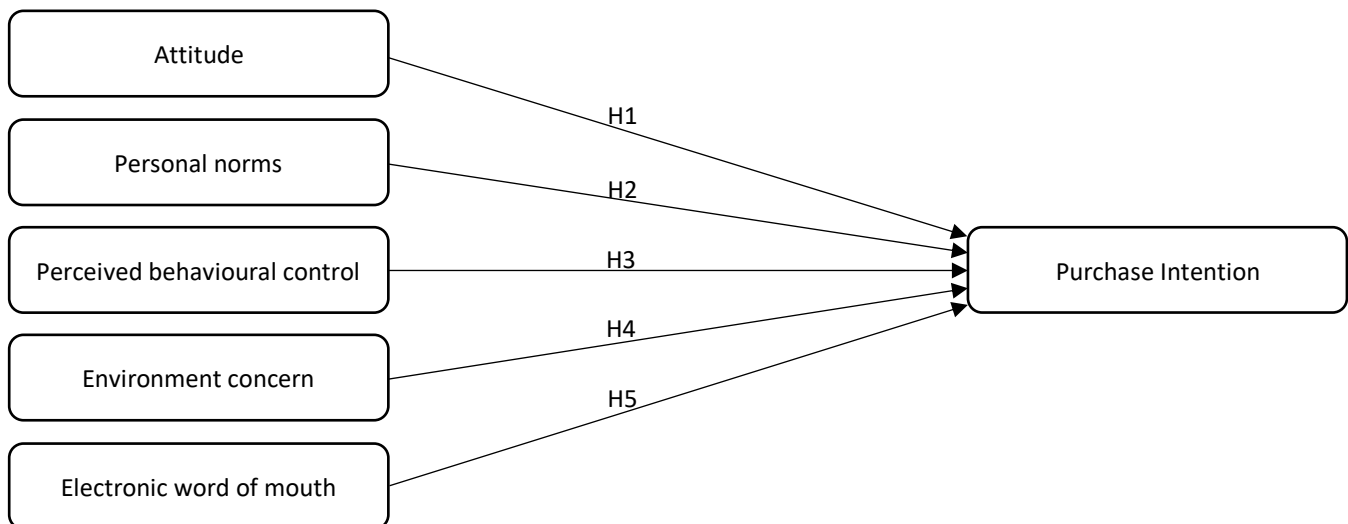**H5: There is a positive significant relationship between electronic word of mouth**

Figure 1. Conceptual Framework

Research Methods

Quantitative research is used in this research to analyse the relationship between the independent variables, which are attitude, personal norms, perceived behavioural control, environment, and electronic word of mouth, and the dependent variable, which is purchase intention. The quantitative research method is suitable for this research because of its objectivity and reliability. It will create meaning and knowledge for the sustainability and environmental fields. The target population of this research is the group of food consumers who are over the age of 18 old and have an income because they are considered as adults and have the ability to make accurate and broad decisions. They also have the ability to earn the money on their own and always purchase food in their daily lives. Hence, food consumers who are at least 18 years old and have income participated in this research. In the end, a total of 220 questionnaires were distributed to the participants.

Using G*Power to calculate the required sample size of this study, the minimum sample size is 55 respondents. However, the sample size should be 200 and above (Tanaka, 1987). This is because larger samples more accurately reflect the population, and sample statistics are more closely aligned with population parameters (Ben-Zvi et al., 2015). In this study, 220 questionnaires were distributed to the food consumers who fulfilled the requirement, but only 200 questionnaires were collected to conduct the following data analysis. The questionnaires in the Google form were distributed online to collect the needed data. In addition, the questionnaires were also distributed in two physical shopping malls because shopping malls are places where food consumers often buy food in their daily lives. The questionnaire is in English and consists of two parts, which are Section A and Section B. Section A is designed to collect the demographic information of the respondents and their behaviour toward social media, while Section B is designed to ask questions about the independent variables and dependent variables. The nominal scales were used in Section A of the questionnaires to identify the demographic of each respondent. Interval scales were used in Section B, in which the items range from 1-Strongly Disagree to 5-Strongly Agree.

Moreover, a pilot test was carried out before collecting the data for the main research to test the research procedures and the validity of the instruments. Hence, 30 sets of questionnaires were distributed to the target respondents for the pilot testing. This is because a pilot study should be around 10% of the sample size for the main research (Connelly, 2008). The Cronbach's alpha result of the pilot test is shown in the table below.

Table 1. Pilot Test

No	Variables	Cronbach's Alpha	Number of items
1	Attitude	0.873	3
2	Personal Norms	0.897	4
3	Perceived Behavioural Control	0.893	7
4	Environment Concern	0.742	4
5	Electronic Word of Mouth	0.893	4
6	Purchase Intention	0.646	5

Data checking was performed by checking whether the respondents have answered all the questions in the questionnaires since incomplete questionnaires might happen. The researcher also checks whether the respondents have fulfilled the requirement of the target

respondents which must 18-year-old and above and have income. Additionally, data coding was performed when the researcher codes the 5-point Likert scale that were used in Section B to measure the independent variables and dependent variable. The researcher coded "SD" as 1, "D" as 2, "N" as 3, "A" as 4, and "SA" as 5 in Microsoft Excel.

In the data analysis, descriptive statistics are obtained from the SPSS 28, and it reduced a large amount of data into presentable forms of tables and charts. Inferential analysis such as Multiple Linear Regression Analysis was also conducted in this research. Multiple Linear Regression Analysis is used to investigate the degree of the five independent variables (attitude, personal norms, perceived behavioural control, environment concern, and electronic word of mouth) on the dependent variable, which is purchase intention.

Results and Discussion
Demographic analysis

Table 2. Demographic analysis

Demographic	Category	Frequency	Percentage (%)
Gender	Female	133	66.5
	Male	67	33.5
Age	18-20	8	4.0
	21-30	98	49.0
	31-40	57	28.5
	41-50	33	16.5
	51-60	4	2.0
Race	Malay	30	15.0
	Chinese	138	69.0
	Indian	32	16.0
Highest Education Level	UPSR	0	0.0
	SPM/IGCSE	12	6.0
	Foundation	13	6.5
	Diploma	31	15.5
	Undergraduate	122	61.0
	Postgraduate	18	9.0
	STPM	4	2.0
Marriage Status	Single	106	53.0
	Married	91	45.5
	Divorced/Widow	3	1.5
Family size	1 person	2	1.0
	2 – 3 persons	62	31.0
	4 – 5 persons	98	49.0
	More than 5 persons	38	19.0
Personal Monthly Income	Less than RM1000	4	2.0
	RM1001 – RM 2000	61	30.5
	RM2001 – RM3000	69	34.5
	RM3001 – RM4000	38	19.0
	RM4001 – RM5000	14	7.0
	More than RM5000	14	7.0
Household Monthly Income	Less than RM1000	0	0.0
	RM1001 – RM 2000	4	2.0
	RM2001 – RM3000	14	7.0

	RM3001 − RM4000	46	23.0
	RM4001 − RM5000	58	29.0
	More than RM5000	78	39.0
Demographic	Category	Frequency	Percentage (%)
Frequency of Reading	1 − 3 times	72	36.0
Online Reviews on Social	4 − 6 times	56	28.0
Media	7 − 9 times	37	18.5
	10 times or more	35	17.5
Type of social media used	Facebook	174	87.0
	Instagram	148	74.0
	WeChat	67	33.5
	WhatsApp	123	61.5
	Twitter	31	15.5
	YouTube	111	55.5
	Pinterest	16	8
	Snapchat	19	9.5
	TikTok	43	21.5
	Other (Xiao Hong Shu, Browser)	5	2.5

Table 2 shows the data collected and the summary of the respondent's demographic. Most of the respondents are between the age of 21-30 and receive tertiary education. This indicates that they are adults who can think maturely and make accurate decisions. Besides, most of the respondent's income is between RM2001-RM3000, and this indicates that they have the buying power relating to sustainable food packaging. Hence, they are the population that should be investigated and is suitable for this research.

Reliability Analysis

Table 3. Reliability Analysis

	Variables	Cronbach's Alpha	Number of items	Strength
Independent Variables	Attitude	0.873	3	Very Good
	Personal Norms	0.856	4	Very Good
	Perceived Behavioural Control	0.872	7	Very Good
	Environment Concern	0.853	4	Very Good
	Electronic Word of Mouth	0.865	4	Very Good
Dependent variable	Purchase Intention	0.861	5	Very Good

Based on table 3, the Cronbach's alpha for all the variables, which include the independent variables and the dependent variable, are between 0.8 and 0.9. This indicates a very good level of reliability.

Multiple Linear Regression Analysis

Table 4. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.743a	.552	.541	.36093

According to table 4, the value of R is 0.743, R-Square is 0.522, Adjusted R-Square is 0.541, and Std. Error of the Estimate 0.36093. The Adjusted R-Square of 0.541 indicates that

54.1% of the changes in customers' purchase intention can be explained by attitude, personal norms, perceived behavioural control, environment concern, and electronic word of mouth.

Table 5. Anova

Model		Sum of Squares	Df	Mean Square	F	Sig
1	Regression	31.175	5	6.235	47.862	<0.001b
	Residual	25.272	194	.130		
	Total	56.447	199			

Table 5 shows that the F-value of this research is 47.862 with a significant level of <0.001. Hence, the significant value of less than 0.05 shows that the independent variables had a significant effect on the customer's purchase intention.

Table 6. Coefficients

Model		Unstandardised B	Coefficients Std. Error	Standardised Coefficients Beta	t	Sig
1	(Constant)	.966	.203		4.751	<0.001
	A	.128	.050	.170	2.550	.012
	PN	.040	.076	.046	.529	.597
	PBC	.237	.064	.248	3.726	<.001
	EC	.140	.066	.164	2.107	.036
	EWOM	.249	.060	.286	4.125	<.001

Based on table 6, the regression equation could be returned as: $PI=0.966+0.128A+0.040PN+0.237PBC+0.140EC+0.249EWOM$. This indicates that electronic word of mouth is the highest contributor to purchase intention. This is followed by perceived behavioural control.

In the multiple linear regression, the significant value that is above or equal to 0.05 would be rejected. For attitude, the t-value is 2.550 and it has a significant value of 0.012. Since the significance value of attitude is less than 0.05, the results show that there is a relationship between attitude and purchase intention. According to Zagata (2012), an individual's positive attitude towards environmentally friendly packaging is a good starting point to stimulate their purchase willingness. The result shows that consumer who has positive attitude are ready to buy environmentally friendly packaging. Therefore, a positive attitude will have a positive impact on the purchase intention.

For the personal norms, the t-value is 0.529 and it has the highest significance value of 0.597. Since the significance value of personal norms is greater than 0.05, the relationship between personal norms and purchase intention is not supported. It has the lowest standardised beta, which is 0.046. Nielsen (2011) found that consumers have a positive attitude toward green products, but they do not choose green products. While most consumers maintain a positive attitude towards the environment, they are self-interested. Therefore, although consumers have the idea of protecting the environment, they pay more attention to their own interests and are unwilling to buy environmentally friendly products.

The t-value of perceived behavioural control is 3.742 and it has a significance value of less than 0.001. Since the significance value of perceived behavioural control is less than 0.05, the results show that there is a relationship between perceived behavioural control and purchase intention. Vermeir and Verbeke (2008) expressed that logistics efficiencies such as communicating the availability of green products and the diversity of green products can increase perceived availability beliefs and convenience. Consumers' purchase intentions can be

increased by increasing their controllability in the form of more green options. Thus, consumers can have a positive impact on the use of sustainable packaging products by controlling their consumption.

The t-value of environment concern is 2.107 and it has a significance value of less than 0.036. Since the significance value of environment concern is below 0.05, hence, there is a relationship between environment concern and purchase intention. Hartmann and Apaolaza-Ibáñez (2012) found that individuals who have strong concerns about the environment will voluntarily choose behaviours that are beneficial to the environment. Before they take an action, they will consider whether it harms the environment. For this reason, they will be willing to pay more to buy and support environmentally friendly products.

For electronic word of mouth, it has the highest t-value, which is 4.125, and has a significance value of less than 0.001. The significance value of electronic word of mouth is less than 0.05. Therefore, there is a significant relationship between electronic word of mouth and purchase intention. Hu et al. (2012) state that electronic word of mouth influences the consumer's purchase decision. The consumer who depends on online information such as brand awareness, opinions, and attitudes of other consumers will have full trust in it (Mangold and Faulds, 2009). This kind of information can be searched on social networking sites to read positive reviews for the product. These complimentary comments influence potential customers' intentions to buy goods.

Implication of study

The theoretical implication is this research will be very useful to other researchers when they want to find information to do their research. This is because this research includes two additional variables—environmental concern and electronic word of mouth—that are not included by other researchers in their studies.

The managerial implication is that food companies should focus on research related to innovative materials used for packaging. The food company needs to redesign the food packaging to reduce the amount of plastic that has been used in its original packaging. Additionally, the food company should increase their advertising efforts about sustainable food packaging on social media such as Facebook, Instagram, and WhatsApp. This is supported by the data that had been collected in the questionnaires, which suggests that these three social media platforms are the most frequently used by people nowadays.

The social implication is that consumers can recycle, reuse, and compost the sustainable food packaging. They can just throw the sustainable food packaging in the recycling bin for reuse if the packaging is clearly marked as recyclable. Additionally, the government should impose stricter rules and regulations to promote the use of sustainable packaging. Governments can impose additional charges, such as taxes, on the materials used by food companies in their packaging to deter the use of harmful materials.

Conclusions

The plastic food packaging waste problem and the consumer demand for sustainable food packaging have increased in many countries. This research has used the Theory of Planned Behaviour with additional variables and Dual Process Theory to deeply understand the factors that influence consumer purchase intention. The result of this research shows that attitude, perceived behavioural control, environment concern and electronic word of mouth have positive

and significant relationships with consumer purchase intention. Hence, different parties including the government and food companies should take action to satisfy consumers' needs and have a world with less food packaging waste.

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