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(IJIREV)[www.ijirev.com](http://www.ijirev.com)IMPACT OF SIMPLIFIED PACKAGING DESIGN ON  
PERCEIVED ECO-FRIENDLINESS AND SUSTAINABLE  
BUYING INTENTION AMONG CHINESE STUDENTSHuang WenJun<sup>1</sup>, Azhari Md Hashim<sup>2\*</sup>, Wang Yuan<sup>3</sup><sup>1</sup> Faculty of Art and Design, Universiti Teknologi MARA (UiTM)

Email: 2022973635@student.uitm.edu.my

<sup>2</sup> Universiti Teknologi MARA (UiTM) Kedah Branch

Email: azhari033@uitm.edu.my

<sup>3</sup> Faculty of Art and Design, Universiti Teknologi MARA (UiTM)

Email: 59871591@qq.com

\* Corresponding Author

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Huang, W. J., Md Hashim, A., & Wang, Y. (2025). Impact Of Simplified Packaging Design On Perceived Eco-Friendliness And Sustainable Buying Intention Among Chinese Students. *International Journal of Innovation and Industrial Revolution*, 7 (23), 553-567.

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This work is licensed under [CC BY 4.0](https://creativecommons.org/licenses/by/4.0/)**Abstract:**

Increased environmental awareness and sustainability-induced consumption have paved the way for packaging design to be the major factor that influences consumers by presenting them with eco-friendly products. The present research investigates the impact of minimalist packaging on the perceived green image (PGI) and purchase intention (PI) among university students in China, a group that is often connected with the sustainability consumption trend. The objective is to determine whether a product that has been packed in a minimalist way is viewed as more eco-friendly and, thus, its purchase intention is increased as opposed to that of a product in a non-minimalist package. The study carried out was a quantitative, between-subjects, experiment study, which involved 210 participants randomly assigned to either two packaging conditions. The data was collected by an online survey and were analyzed via SPSS and the PROCESS macro created by Hayes in order to find out whether PGI was a mediator that traced a correlation between packaging design, PI and PGI. The analysis led to the conclusion that minimum packaging generated about 54 percent of the variance and complete the relationship between packaging design and purchase intention in terms of PGI. This translated into a much greater score in PGI and PI ( $p < 0.001$ ). The study contributes to the literature on the topic by showing the ways in which visual simplicity can be used as a selling point of a sustainable choice and it offers marketers an idea of how to combine minimalist beauty with environmental concerns in designing a pack structure.

**Keywords:**

Minimalist Packaging, Perceived Green Image, Purchase Intention, Eco-Friendly Perception, Consumer Behavior, Visual Persuasion.

**Introduction**

Both the rise in environmental concerns and the rising nature of sustainability as an issue by the younger generations have collectively led to a shift in how consumers purchase goods, particularly in terms of greener packaging. In China, the consumption scenario is shifting rapidly; therefore, the role of the packaging design in driving sustainable consumption is gaining growing importance (Deng & Yang, 2024). The key approach that contributes to making people consider the product to be environmentally positive and therefore makes them purchase green is the minimalistic packaging that has clean designs and less use of materials (Ding et al., 2024; Zhang, 2024). Research proves that the green packaging design has an impact on the consumers' environmental attitudes and willingness to purchase through the establishment of a visual link with sustainability values (Wang and Mohamed, 2024). Besides, minimal design promotes customer trust and perceived authenticity, which in turn, supports sustainable choices (Ding et al., 2024).

It has been found that the price consumers are willing to pay for eco-friendly packaging varies according to the visual attractiveness and the degree of understanding of environmental benefits (Yan et. al., 2025). The design of green packaging in China, especially among the youth, portrays the fusion of aesthetic simplicity and sustainability perception (Wang and Mohamed, 2024). Socio-cultural factors are also very essential in forming these views because people from the West and East might interpret green signals in dissimilar ways (Bravo & Vieira, 2024). Furthermore, green advertising and perceived value serve as mediators in linking packaging design with purchase intentions (Inggrid et. al., 2024; Siuda & Grębosz-Krawczyk, 2025).

It is of utmost importance to comprehend the impact of simplified packaging on the Chinese students' perceived eco-friendliness and sustainable purchasing intentions to devise green marketing strategies that effectively combine environmental responsibility with consumer expectations (Xiong & Zhang, 2021; George et. al., 2023).

The primary objectives of this research are to determine whether minimalist packaging design can enhance the eco-friendliness image of a product in the minds of Chinese university students and, consequently, lead to an increased buying intention. To be more precise, the research will be investigating the way in which the green image and sustainable purchasing behavior are controlled by the packaging style (non-minimalist vs. minimalist). In addition, it also hopes to develop a theoretical model that will explain how the image simplicity in packaging modifies the attitude of the environment and consequently consumer preference. This study will aim at offering a more in-depth understanding of the degree to which the environmental awareness of the young generations influences their consumption choices towards sustainability by targeting college students.

## Review Of Literature

The growing popularity of green consumerism has increased the importance of environmentally friendly and minimalist packaging in the process of making a purchasing choice. Sustainable packaging does not only reflect on the company's sustainability but also contributes a lot in terms of consumer attitude and purchase behaviors. Esvandiari et al. (2023) demonstrated that the mediator in the relationship between the purchase intention and environmentally friendly packaging is the perception of the consumer. They have indicated that psychological interpretation is a critical element in transformation of the sustainable cues into actual purchase behavior.

Similarly, Perret, Gomez Velasquez and Mehn (2025) have discovered that the factor that exerted the most significant effect on the willingness of the customers to pay in addition to the perception of product sustainability was the packaging design in the cosmetic industry. It means that the selection of the eco-friendly materials, as well as the design of the packaging, play an essential role in building the brand that would be responsible to the environment. The review of the literature has shown that environmental concern, trust, and perceived value are among the many factors that positively influence the intention to purchase green products (Patiño-Toro et. al., 2024).

Choosing the right materials and considering the packaging life cycle are also essential aspects. Mudgal, Pagone, and Salonitis (2024) pointed out that packaging strategies that do not say "sustainable" should integrate with consumer preferences to ensure that both ecological and market effectiveness are secure. Consumer attitude is a powerful characteristic of the materials based on their environmental friendliness and Sokolova, Krishna, and Döring (2023) have validated it in their study concerning the paper vs. plastic. They emphasize the use of credible and transparent claims on sustainability. At the same time, Srivastava et al. (2022) assumed that the packaging in the cosmetics industry would serve as a branding agent, thus affecting consumer attitudes and brand messaging matching sustainability of the product in a certain sense.

Circular packaging and green habits further sustainable consumption are promoted by the online shopping scenario. The article by Lee (2022) found that a preference towards circular packaging practices is approaching the news readers and those interested in eco-friendly operations, and Liang et al. (2022) established that package size and simplicity support the intention to buy, particularly organic food products. In addition to this, geographical and cultural considerations are also important: Moorthy et al. (2021) identified demographic and cultural variables that affect green packaging in Malaysia, and Gupta and Singh (2025) have registered similar tendencies in tier-three Indian cities, which proves that not all consumers adhere to sustainable packaging.

Green packaging also has effects that are propagated through branding and customer loyalty. Aryani et al. (2025) claimed that sustainable material utilization has a positive effect on the brand image and customer loyalty and hence related sustainability to the competitive advantage. In the correlation between the green consumption behavior and packaging, Farooq, Majid, and Ahmed (2023) identified social influence, perceived consumer effectiveness, and green satisfaction as the intermediary and modifying factors involved in the relationship between packaging and green consumption behavior.

Duarte et al. (2024) put forth the argument that the facilitators of the increases in the purchasing intention towards sustainable packaging products are considered to be the strategic determinants, like visual simplicity and material transparency. Hallez, Boen, and Smits (2025) concluded that eco-friendly packaging may affect food perception and consumer preferences on the reality basis, as well, and this is why much attention is paid to the importance of design as it can guide consumers to make environmentally friendly choices. Finally, but not the least, Sethi and Malviya (2025) established the fact that consumer perception and loyalty are critical in transforming the intention to buy the eco-friendly packaging into the real purchase.

## **Methodology**

### ***Research Design***

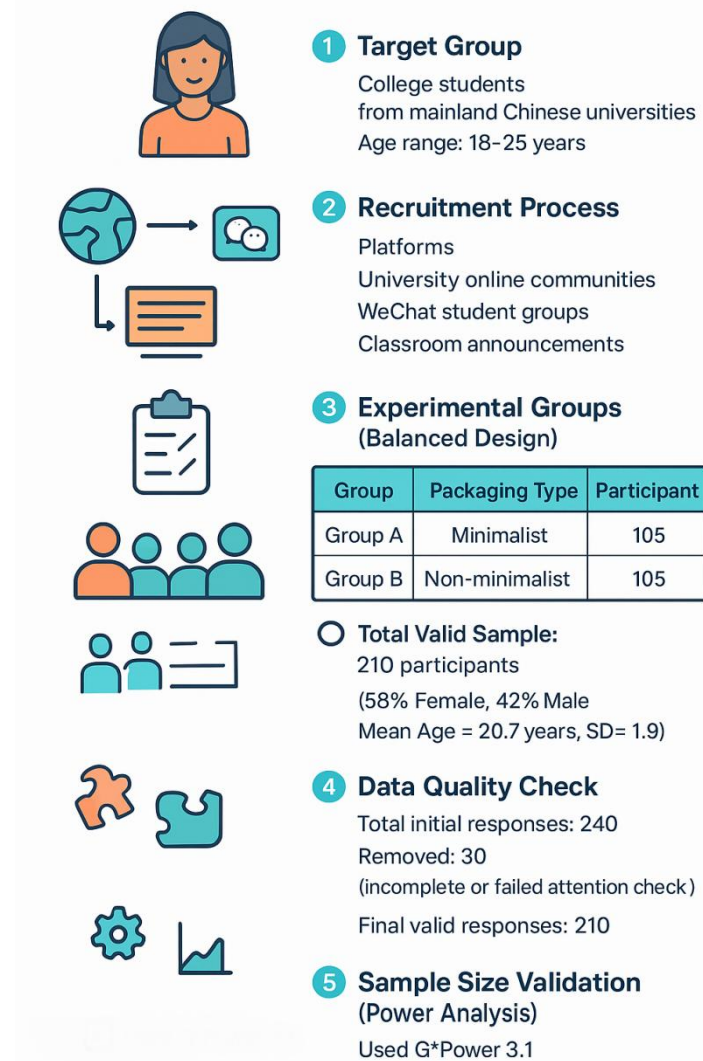
The research was carried out based on the experimental design- between subjects, quantitative research, using visual stimuli and post exposure questionnaire. The choice of the design was determined in order to determine the causal effect of minimalist packaging on the image of the product perceived to be eco-friendly as well as the intention to buy a Chinese college student customers. Packaging style was the independent variable and it consisted of two experimental conditions namely (1) minimalist and (2) non-minimalist packaging. Perceived green image (PGI) and purchase intention (PI) were the dependent variables.

The theories of visual persuasion and environmental psychology are appropriate to the research design since they claim that design cues may elicit cognitive and affective appraisals, therefore, affecting consumer behavior. According to the proposed theoretical framework, minimalist packaging (clear, simple images) positively influences how consumers perceive environmental friendliness. The mediation process thus is statistically tested using regression-based analysis, hence providing an insight into the direct and indirect impacts of visual simplicity on sustainable consumer decision-making.

### ***Population and Sampling***

The target population for this study was college students who are taking courses in mainland Chinese universities, specifically those aged between 18 and 25 years. This age group was selected for two purposes: (1) previous studies have shown that younger consumers tend to be more receptive to sustainable design and eco-friendly marketing, and (2) restricting the population to a homogeneous age and educational group will raise internal validity by eliminating external confounding factors such as income and education level.

Participants were recruited through online university communities, marketing through students' WeChat groups, and making announcements in class. Though convenience sampling was used to reach and make the necessary steps easier, random assignment within the study ensured there were equal groups and that selection bias was reduced to a minimum (Figure 1).



**Figure 1. Overview of Population and Sampling Process in the Experimental Study**

The number of students who showed interest and participated in the online experiment reached 240. Out of those, 210 were finally considered (105 in the minimalist condition and 105 in the non-minimalist condition) after incomplete responses, and those that did not pass the attention-check questions were excluded. The male/female ratio was 58% female and 42% male, and the average age of participants was 20.7 years ( $SD = 1.9$ ).

An a priori power analysis was carried out with G\*Power 3.1 to get the smallest number of subjects that would be needed to show a medium effect (Cohen's  $d = 0.45$ ) at  $\alpha = 0.05$  and power  $(1-\beta) = 0.80$ . The number required per group was calculated using equation 1.

$$n = 2 * \left( \frac{Z_{1-\frac{\alpha}{2}} + Z_{1-\beta}}{\frac{\Delta}{\sigma}} \right)^2 \quad (1)$$

In this formula,  $Z_{1-\alpha/2}$  is the critical z-value for a two-tailed test (1.96 for  $\alpha = 0.05$ ),  $Z_{1-\beta}$  corresponds to power (0.84 for 80%), and  $\Delta/\sigma$  stands for the standardized mean difference (Cohen's  $d$ ). The calculation gave a minimum of 98 subjects per group, and therefore, the sample obtained ( $n = 210$ ) was statistically sufficient.



***Experimental Stimuli Development***

The two types of packaging designs manufactured for the fictional eco-friendly hand soap brand made it a point that only the visual style was different from each other in the two conditions.

**Minimalist Packaging:** it was designed by the neutral color palette (white, light beige), simple sans-serif typography, limited text, and a small green leaf icon to represent eco-consciousness. The design proposed the use of negative space and simplicity, which was in line with the minimalist aesthetic principles.

**Non-Minimalist Packaging:** it consisted of riotous hues, complicated typefaces, enormous product claims, and ornamental patterns that, in other words, were reminiscent of the conventional commercial style.

To rule out any possibility of confounding variables, the identical product information (brand name, quantity, and price) was represented on both stimuli. A small-scale test with 30 students verified that the minimalist version was seen as a lot simpler and cleaner than the non-minimalist version ( $M_{\min} = 6.20$ ,  $M_{\text{non}} = 3.10$ ,  $p < 0.001$ ).

***Instruments and Measurement***

The data collection process was done through an online questionnaire that was set up on Wenjuanxing (Questionnaire Star). The instrument was divided into five sections and used seven-point Likert scales (1 = strongly disagree, 7 = strongly agree).

**Manipulation Check** – an item assessing perceived simplicity: “This packaging design looks minimalist.”

**Perceived Green Image (PGI)** – five items adapted from Chen et al. (2010), among which “This product looks environmentally friendly” and “The packaging conveys ecological responsibility” are included.

**Purchase Intention (PI)** – three items adapted from Dodds et al. (1991), including “I would consider buying this product” and “I would recommend this product to others.”

**Environmental Concern** – four items adapted from Dunlap’s NEP scale for controlling purposes.

**Demographic Data**- age, gender, university, and self-reported environmental behaviors. Cronbach's alpha reliability coefficient was used to find the internal consistency of each construct by using equation 2 below.

$$\alpha = \left( \frac{k}{(k-1)} \right) * \left( 1 - \frac{(\sum_{i=1}^k \sigma_i^2)}{\sigma_{total}^2} \right) \quad (2)$$

In this case, where  $k$  is the total items,  $\sigma_i^2$  means the amount of variance of an item and the total  $\sigma_{total}^2$  represents the total variance of the stacked scale.

The reliability of the instruments was deemed good: PGI ( $\alpha = 0.88$ ), PI ( $\alpha = 0.90$ ), and Environmental Concern ( $\alpha = 0.84$ ).

**Data Collection Procedure**

This experiment was conducted online using online links and the university review board gave them the go-ahead. The respondents were initially provided with the consent form to go and read it, that participation was voluntary and that the respondent(s) would remain anonymous. In case they consented, the two available survey software randomizers randomly allocated them to either one of the two conditions of packaging. The respective participants were also made to see the given packaging image at minimum of 10 seconds to maintain the level of exposure. Thereafter, they proceeded to fill the questionnaire that took approximately 8-10 minutes altogether. The questionnaire contained a few attention check questions (i.e., Please, choose option 5 to this question) to test the attention of the participants. The online collection of the data was carried out within the period of two weeks in April of 2025. The reward was an electronic voucher (¥10-20) draw that all the respondents that completed the study were put into.

**Data Cleaning and Manipulation Checks**

The data contained some missing data, extremely quick response time and blank attention check items. There were 13 instances that were dropped and 210 observations that became valid. The manipulation checks determined that the subjects perceived these visual variations well. The independent-samples t-test results showed that the minimalist packaging was evaluated to be significantly more minimalist than the non-minimalist design ( $M_{\text{min}} = 6.12$ ,  $M_{\text{non}} = 3.28$ ,  $t = 10.25$ ,  $p < 0.001$ ), which is calculated using equation 3.

$$t = \frac{(\bar{X}_1 - \bar{X}_2)}{\sqrt{\left(\frac{s_1^2}{n_1}\right) + \left(\frac{s_2^2}{n_2}\right)}} \quad (3)$$

In this case,  $\bar{X}_1$  and  $\bar{X}_2$  denote the means of the samples, and the characters  $s_1^2$  and  $s_2^2$  denote the variances of the samples.

**Data Analysis Strategy**

The statistical analyses were conducted using SPSS 28.0 and PROCESS macro (Model 4, 2018) by Hayes. The flow of analysis was in four stages:

Descriptive Statistics -Mean, standard deviation, and normality tests of all the variables.

Differences between groups: Independent-samples t-tests of comparison between PGI and PI between the two conditions of packaging.

Correlation Analysis This is the correlation analysis between packaging style, PGI, and PI.

Mediation Analysis -Determining the indirect impact of the packaging style on the purchase intention via the image of perceived green. Two regression equations (4) and (5) were used to lay out the mediation model.

$$M = \beta_{0m} + aX + \varepsilon_m \quad (4)$$

$$Y = \beta_{0y} + c'X + bM + \varepsilon_y \quad (5)$$

Where X is the packaging style (0 = non-minimalist and 1 = minimalist), M is the perceptions image of green, and Y is the purchase intention. c a is the effect of packaging on PGI, c b is the effect of PGI on PI, and c c is the effect of packaging on PI that is not mediated.

Indirect effect ( $a \times b$ ) was calculated by bootstrapping (5,000 resamples, 95 percent interval). There is a marked significant difference when the confidence interval does not include zero. In addition, Sobel test was determined by equation (6).

$$z = \frac{(a * b)}{\sqrt{(b^2 * SE_a^2) + (a^2 * SE_b^2)}} \quad (6)$$

Where  $a$  and  $b$  are the unstandardized path coefficients, and  $SE_a$  and  $SE_b$  are their corresponding standard errors. Cohen's  $d$  was employed for reporting the effect sizes for group comparisons and  $R^2$  for model fit.

## Results and Discussion

### *Data Cleaning and Screening Outcomes*

Initially, a total of 240 responses from participants were gathered using the online survey platform. A data reliability and accuracy screening was then performed before the analysis. Out of these, 30 responses were eliminated due to lack of full submissions, and 13 were excluded for not passing the attention-check question or for finishing the survey in less than four minutes, which was considered as inattentive participation (Table 1). This resulted in the retention of 210 valid responses, with a data retention rate of 87.5%, and an equal representation of minimalist ( $n = 105$ ) and non-minimalist ( $n = 105$ ) groups. The  $z$ -score analysis (threshold  $\pm 3.0$ ) used for outlier detection found no significant univariate outliers. The boxplots also support the idea that the variables of Perceived Green Image (PGI) and Purchase Intention (PI) were normally distributed with no skewness. The missing data analysis revealed that no variable had more than 2% missing values, and Little's MCAR test ( $\chi^2 = 15.23$ ,  $df = 17$ ,  $p = 0.58$ ) confirmed that the missing patterns were random. Mean substitution was performed for the replacement. All these high-standard processes ensured the integrity of data and representativeness, thus improving the quality of further inferential analyses.

**Table 1. Data Screening Summary**

Step	Criterion	Excluded (n)	Remaining (n)	Remarks
Initial responses	—	—	240	Raw dataset
Incomplete submissions	Missing >20% items	30	210	Removed
Failed attention check	Incorrect response / <4 min	13	197	Removed
Final valid dataset	—	—	210	Used for analysis

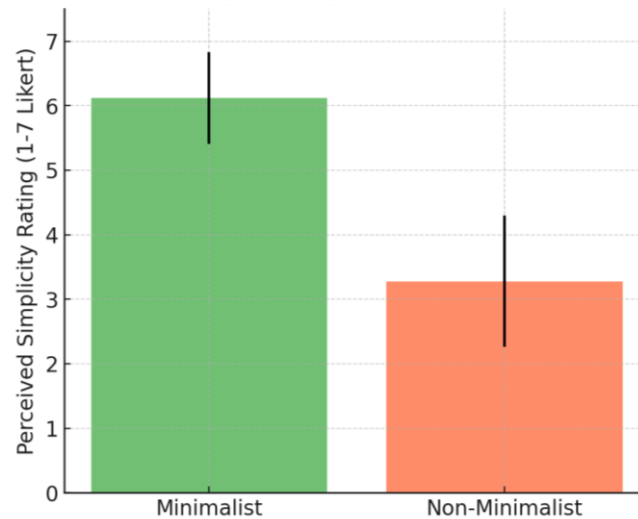
After data screening and validation, there was a descriptive statistics and reliability analysis to define the basic distributional properties and measure quality of the key variables before the hypothesis testing.

### *Descriptive Statistics and Reliability Analysis*

The descriptive statistics were drawn to obtain a description of the responses of the participants to the major research variables. Meanwhile, Cronbach alpha coefficients were taken as the measurement of internal consistency reliability. The sample provided equal group sizes ( $n = 105$  each), which was a good condition for comparatives. Seven-point Likert scales, which



denoted 1 (strongly disagree) and 7 (strongly agree), were used for the items consistently with the design of the instrument as described in the methodology. The results in Table 2 indicate that the participants under minimalist packaging had a higher Perceived Green Image ( $M = 5.82$ ,  $SD = 0.78$ ) and Purchase Intention ( $M = 5.54$ ,  $SD = 0.85$ ) compared to the non-minimalist packaging (Figure 2).



**Figure 2. Mean Perceived Simplicity Ratings for Minimalist and Non-Minimalist Packaging (With SD Error Bars).**

Environmental Concern, measured as a covariate, gave a moderate overall mean score of 4.96. All the Cronbach's  $\alpha$  values were above 0.84, indicating excellent internal consistency. The values of skewness and kurtosis were all within the range of  $\pm 1.0$ , thus confirming the existence of near-normal distributions, which are ideal for parametric testing. According to the descriptive statistics, Hypotheses 1 and 2 have a good rank, which implies that quantities of minimalist packaging result in the more environmentally friendly perception of green and behavioral intention.

**Table 2. Descriptive Statistics for Key Variables (N = 210)**

Variable	Condition	N	Mean (M)	SD	Skewness	Kurtosis	Cronbach's $\alpha$
Perceived Green Image (PGI)	Minimalist	105	5.82	0.78	-0.41	0.25	0.88
	Non-Minimalist	105	4.35	0.96	-0.1	-0.47	—
Purchase Intention (PI)	Minimalist	105	5.54	0.85	-0.32	0.12	0.9
	Non-Minimalist	105	4.18	1.02	-0.21	-0.65	—
Environmental Concern	Combined	210	4.96	0.89	-0.27	0.1	0.84

Having affirmed that there were satisfactory reliability and initial differences in means, the final step worked out the possibility of whether the experimental manipulation as packaging simplicity was perceived as intended.

### ***Manipulation Check***

To check whether the experimental manipulation had the wanted effect or not, the participants were to evaluate the simplicity of the package design. A t-test for independent samples was applied to compare the simplicity ratings of the two conditions, minimalist and non-minimalist (Table 3). The outcome yielded a difference at a statistically significant level ( $t(208) = 10.25$ ,  $p < 0.001$ , Cohen's  $d = 1.38$ ). In other words, the minimalist packaging ( $M = 6.12$ ,  $SD = 0.71$ ) received a much higher score than the non-minimalist packaging ( $M = 3.28$ ,  $SD = 1.02$ ).

**Table 3. Manipulation Check Results**

Group	N	Mean	SD	t	p	Cohen's d
Minimalist	105	6.12	0.71	10.25	<0.001	1.38
Non-Minimalist	105	3.28	1.02	–	–	–

The magnitude of this effect size is indicative of a very clear differentiation between the experimental conditions in the participants' minds, thus confirming the internal validity of further analyses. Having determined the effectiveness of the manipulation, other analyses studied whether the perceived green image and purchase intention when using the two packaging conditions differed significantly.

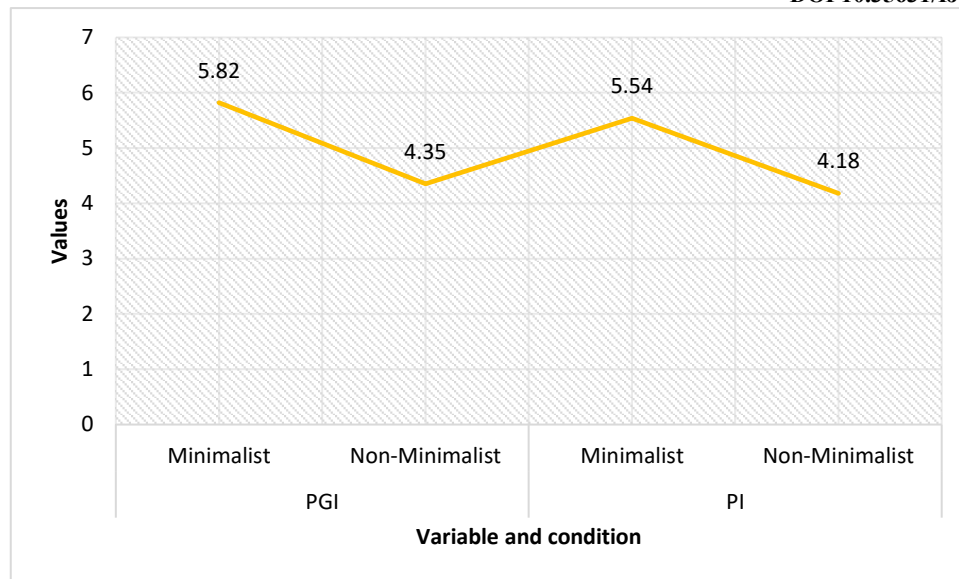
### ***Group Differences in Perceived Green Image and Purchase Intention***

To investigate the differences in perceived green image and purchase intention between the two packaging conditions, independent-samples t-tests were performed. The results presented in Table 4 indicate that both dependent variables had statistically significant mean differences with the minimalist packaging portraying a more positive green image ( $t(208) = 11.87$ ,  $p < 0.001$ ,  $d = 1.63$ ) and acceptance to buy ( $t(208) = 10.26$ ,  $p < 0.001$ ,  $d = 1.42$ ).

**Table 4. Independent-Samples t-Test Results**

Variable	Condition	Mean	SD	t	p	Cohen's d
PGI	Minimalist	5.82	0.78	11.87	<0.001	1.63
	Non-Minimalist	4.35	0.96	–	–	–
PI	Minimalist	5.54	0.85	10.26	<0.001	1.42
	Non-Minimalist	4.18	1.02	–	–	–

This influence can be attributed to visual simplicity being associated with a lower level of material consumption which consumers tend to instinctively perceive as the decreased threat to the environment. Such minimal cues like clean layout or limited color scheme probably trigger sustainability-related schemas, which consumers utilize to draw inferences of eco-friendliness even without any clear claims regarding the environmental friendliness. The effect sizes being this substantial, it can be concluded that there was a great impact of visual cues of minimalism on the perception of sustainability, as well as on the intention to purchase (Figure 3).



**Figure 3. Comparison Of Perceived Green Image (PGI) And Purchase Intention (PI) Between Minimalist and Non-Minimalist Packaging Conditions.**

In addition to the mean differences across conditions, the correlation study was also done to evaluate the strength and direction of the relationships between packaging style, perceived green image and purchase intention.

Theoretically, the findings are consistent with the assumptions of Cue Utilization Theory, which states that consumers use readily notable external stimuli, including visual simplicity, to draw conclusions about less apparent product qualities, including environmental friendliness. The understated design worked as a conspicuous extrinsic attribute, making the participants be able to make an inference of sustainability without the need to elaborate on information processing.

### **Correlation Analysis**

Pearson correlation coefficients were calculated in order to find out the relationship between different variables. Significant positive correlations can be seen in Table 5 between packaging style and PGI ( $r = 0.62$ ,  $p < 0.01$ ) and between PGI and PI ( $r = 0.69$ ,  $p < 0.01$ ). Environmental Concern exhibited low correlations with PGI ( $r = 0.18$ ,  $p < 0.05$ ) and PI ( $r = 0.15$ ,  $p < 0.05$ ) only.

**Table 5. Pearson Correlation Matrix**

Variable	1	2	3	4
1. Packaging Style	1			
2. Perceived Green Image (PGI)	0.62**	1		
3. Purchase Intention (PI)	0.57**	0.69**	1	
4. Environmental Concern	0.09	0.18*	0.15*	1

Environmental concern had only weak correlations with Perceived Green Image and Purchase Intention and it means that an individual sustainability value would not be the main driver of the response in this experimental condition. This indicates that the participants were more

dependent on visual packaging information as opposed to already existing environmental attitudes to create their eco-friendliness perceptions and purchase intents.

These correlations lend support to the mediation model that has been proposed and imply a link between the PGI and the purchase intention areas—that is, the higher the PGI, the larger the purchase intention. As the relationships between these variables are high, the mediation analysis was conducted in order to formally test the hypothesis that perceived green image determines the mediation role through which the packaging style mediates purchase intention. This is a typical behaviour of Signalling Theory, which argues that minimalist packaging is a plausible sustainability cue which helps to decrease information asymmetry in brand-consumer relationships.

### **Mediation Analysis**

A mediation analysis (PROCESS Model 4) using 5,000 bootstrapped samples determined whether the PGI served as a mediator between the Packaging Style and PI. The significant direct and indirect effects can be seen in Table 6.

**Table 6. Mediation Analysis**

Path	$\beta$	SE	t	p	95% CI
a: Packaging $\rightarrow$ PGI	1.47	0.12	12.25	<0.001	[1.23, 1.71]
b: PGI $\rightarrow$ PI	0.56	0.06	9.33	<0.001	[0.44, 0.68]
c': Packaging $\rightarrow$ PI (Direct)	0.65	0.14	4.64	<0.001	[0.38, 0.92]
Indirect (a $\times$ b)	0.82	0.11	—	<0.001	[0.63, 1.04]
Sobel z	7.85	—	—	<0.001	—
R <sup>2</sup>	0.54	—	—	—	—

PGI completely mediated the influence of the packaging style on the purchase intention, thus confirming H4 and accounting for 54% of the variance in PI. This complete mediation effect upholds both theories of Dual Processing and Heuristic Processing, which states that consumers, especially young adults, use visual heuristics instead of systematic consideration in making sustainability judgments. The Spartan design was a heuristic shortcut that indirectly influenced the purchase intention based on perceived green image as opposed to intentional evaluation of claims regarding environmental friendliness.

This result indicates that simplicity is not a direct pilot action in terms of purchasing products and functions via a perceptual process, as minimalist design leads to an increase in perceived environmental responsibility. The lack of extravagance might be an indicator of the truthfulness and austerity, which strengthens the environmentally friendly meanings on a mental plane. This implies that the consumers do not necessarily buy minimalist-packaged products because of the packaging, but because the packaging makes them perceive the brand as being more environmentally conscious thus leading to purchase intention.

### **Conclusion**

This research indicates that minimalist packaging has a great impact on increasing the perceptions of the consumers about being environmentally friendly and consequently the purchase intention. The results affirm that the visual design cues are important in influencing sustainable consumer behavior with perceived green image being the most significant psychological mechanism that can be used to associate packaging style with purchasing behavior. Notably, ecological aesthetics has the potential of creating positive attitudes and

intentions even to low environmentally concerned consumers. Such findings indicate that marketers have a suitable way of promoting sustainability through the combination of minimalist design messages with environmental protection packaging mechanisms.

### Managerial Implications

The results are that the companies must employ lean packaging styles where visual simplification and explicit environmental indications are utilized to pass the message of environmental responsibility. Businesses must find the right balance between the utilization of eco-friendly materials and minimalistic design to not overdo the claims but to provide the design hint that the place is sustainable. Branding wise, a green brand image can be reinforced by minimum packaging and attract a broader consumer market including low environmental concern customers.

### Limitations

This research has limitations. First, its experimental design was stimulus based not natural purchase, and this might be a limitation of the external validity. Second, the sample was limited to university students, which makes it hard to extend to other groups of consumers. Third, the exposure of the participants to the stimuli of packaging was of a short nature and this might not perfectly reflect the impact of the exposure to the stimuli repeatedly in reality.

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### References

- Aryani, D. N., Chien, N. W., Hui, G. K., Wei, K. T., Hooi, K. M., Ching, L. Y., & Kee, D. M. H. (2025). Green packaging as a branding strategy: How eco-friendly materials influence brand image and customer loyalty. *International Journal of Tourism & Hospitality in Asia Pacific*, 8(3), 441–459. <https://doi.org/10.32535/ijthap.v8i3.4192>
- Bravo, A., & Vieira, D. (2024). Modelling the purchase of green packaged products: The significant impact of the West–East cultural context. *Sustainability*, 16(3), 1206. <https://doi.org/10.3390/su16031206>
- Deng, Y., & Yang, Y.-C. (2024). Impact of green packaging design on green purchase intention. *Social Behavior and Personality: An International Journal*, 52(4), 1–13. <https://doi.org/10.2224/sbp.12893>
- Ding, Y., Meng, X., & Sun, C. (2024). Simplicity matters: Unraveling the impact of minimalist packaging on green trust in daily consumer goods. *Sustainability*, 16(12), 4932. <https://doi.org/10.3390/su16124932>
- Duarte, P., Silva, S. C., Roza, A. S., & Dias, J. C. (2024). Enhancing consumer purchase intentions for sustainable packaging products: An in-depth analysis of key determinants and strategic insights. *Sustainable Futures*, 7, 100193. <https://doi.org/10.1016/j.sfr.2024.100193>

- Esvandiari, M., Susan, M., Mulyaningsih, H. D., Muhandi, Oktini, D. R., & Nurhayati, N. (2023). The effect of eco-friendly packaging on purchase intention with consumer perception as an intervening variable. *International Journal of Entrepreneurship and Sustainability Studies*, 3(2), 62–79. <https://doi.org/10.31098/ijeass.v3i2.1818>
- Farooq, H., Majid, M. B. M. B., & Ahmed, H. (2023). Impact of green packaging, perceived consumer effectiveness, and social influence on green consumption behavior: The mediating role of green satisfaction and the moderating role of environmental awareness. *Global Management Sciences Review*, 8(1), 54–69. [https://doi.org/10.31703/gmsr.2023\(VIII-I\).04](https://doi.org/10.31703/gmsr.2023(VIII-I).04)
- George, H. J., Susainathan, S., & Parayitam, S. (2023). The relationship between green packaging awareness, initiatives, and behavior: An exploratory study on India rural population. *RAUSP Management Journal*, 58(4). <https://doi.org/10.1108/RAUSP-11-2022-0240>
- Gupta, M., & Singh, M. (2025). Green choices: A study of consumer preferences and attitudes towards eco-friendly packaging in the tier three cities of India. *Manthan: Journal of Commerce and Management*, 12(1), 69–97.
- Hallez, L., Boen, F., & Smits, T. (2025). Message in a bottle: How sustainable packaging shapes consumers' food perceptions and non-hypothetical choices. *Journal of Foodservice Business Research*, 1–22. <https://doi.org/10.1080/15378020.2025.2537077>
- Ingrid, Puspasari, T. R., & Yunus, U. (2024). Impact of green advertising and packaging on purchase decisions via green perceived value. *Ilomata International Journal of Social Science*, 5(4), 1102–1119. <https://doi.org/10.61194/ijss.v5i4.1354>
- Lee, Y. C. (2022). News consumption and green habits on the use of circular packaging in online shopping in Taiwan: An extension of the theory of planned behavior. *Frontiers in Psychology*, 13, 1025747. <https://doi.org/10.3389/fpsyg.2022.1025747>
- Liang, S., Qin, L., Zhang, M., Chu, Y., Teng, L., & He, L. (2022). Win big with small: The influence of organic food packaging size on purchase intention. *Foods*, 11(16), 2494. <https://doi.org/10.3390/foods11162494>
- Moorthy, K., Kamarudin, A. A., Lee, X., Lim, M. H., Lim, T. W., Puah, S. F., & Wong, C. (2021). Green packaging purchase behaviour: A study on Malaysian consumers. *Environment, Development and Sustainability*, 23(10), 15391–15412. <https://doi.org/10.1007/s10668-020-01157-z>
- Mudgal, D., Pagone, E., & Salonitis, K. (2024). Selecting sustainable packaging materials and strategies: A holistic approach considering whole life cycle and customer preferences. *Journal of Cleaner Production*, 481, 144133. <https://doi.org/10.1016/j.jclepro.2024.144133>
- Patiño-Toro, O. N., Valencia-Arias, A., Palacios-Moya, L., Uribe-Bedoya, H., Valencia, J., Londoño, W., & Gallegos, A. (2024). Green purchase intention factors: A systematic review and research agenda. *Sustainable Environment*, 10(1). <https://doi.org/10.1080/27658511.2024.2356392>
- Perret, J. K., Gómez Velázquez, A., & Mehn, A. (2025). Green cosmetics—The effects of package design on consumers' willingness-to-pay and sustainability perceptions. *Sustainability*, 17(6), 2581. <https://doi.org/10.3390/su17062581>
- Siuda, D., & Grębosz-Krawczyk, M. (2025). The role of pro-ecological packaging in shaping purchase intentions and brand image in the food sector: An experimental study. *Sustainability*, 17(4), 1744. <https://doi.org/10.3390/su17041744>



- Sokolova, T., Krishna, A., & Döring, T. (2023). Paper meets plastic: The perceived environmental friendliness of product packaging. *Journal of Consumer Research*, 50. <https://doi.org/10.1093/jcr/ucad008>
- Srivastava, P., Ramakanth, D., Akhila, K., & Gaikwad, K. K. (2022). Package design as a branding tool in the cosmetic industry: Consumers' perception vs. reality. *SN Business & Economics*, 2(6), 58. <https://doi.org/10.1007/s43546-022-00222-5>
- Sethi, A., & Malviya, B. (2025). Green packaging and purchase intention: An analysis of consumer perception and loyalty. *International Journal of Environmental Sciences*, 11, 1234–1244. <https://doi.org/10.64252/hpbzxx71>
- Wang, L., & Mohamed, F. N. (2024). A study on the design appeal of green packaging in China. *South Asian Journal of Social Sciences and Humanities*, 5(1), 192–215. <https://doi.org/10.48165/sajssh.2024.5112>
- Xiong, X., & Zhang, X. (2021). Sustainable design on packaging: A case study in a Chinese town. *Proceedings of the Design Society*, 1, 2881–2890. <https://doi.org/10.1017/pds.2021.549>
- Yan, Z., Wang, T., Song, Z., Liu, J., & Lyu, W. (2025). Consumer willingness to pay for green express packaging in e-commerce: An eye-tracking experiment analysis. *Frontiers in Psychology*, 16, 1615315. <https://doi.org/10.3389/fpsyg.2025.1615315>
- Zhang, W. (2024). Minimalist design: Explore the key factors that influence the packaging design of Muji products on consumers' purchasing attitudes. *Creativity and Innovation*, 8(3), 5–21. <https://doi.org/10.47297/wspciWSP2516-252701.20240803>