Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Consumer Perception and Willingness to Pay for Bamboo Based Products through Exhibition Exposure

Marzie Hatef Jalil

hjmarzie@unimas.my

Universiti Malaysia Sarawak

Vanessa Tok Jia Hui

Universiti Malaysia Sarawak

Faridah Sahari

Universiti Malaysia Sarawak

Shaik Azahar Shaik Hussain

Universiti Malaysia Sarawak

Dhea Gusty Adelina

Universiti Malaysia Sarawak

Research Article

Keywords: Engineered Bamboo, Mere Exposure Theory, Sustainable Design, Consumer Perception, Willingness-to-Pay, Exhibition Marketing, Sarawak Creative Economy

Posted Date: March 19th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-9092415/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: No competing interests reported.

Abstract

Growing attention to sustainable materials has positioned engineered bamboo as a promising material in contemporary product and fashion design. However, negative consumer perceptions continue to hinder its wider adoption, as bamboo is often associated with low cost and low durability products. Guided by Mere Exposure Theory, this study examines how exhibition exposure influences consumer perception and willingness to pay for bamboo based products. A quantitative survey was conducted among 135 visitors to an exhibition in Sarawak. The analysis employed descriptive statistics, correlation tests, and multiple regression models to evaluate how visual and tactile exposure influence consumer evaluation and economic intention. The results indicate that perceived durability (β = 0.50) and aesthetic appeal (β = 0.45) are the strongest predictors of willingness to pay, effectively offsetting price sensitivity even among lower income consumer groups. Although environmental sustainability is widely recognized as a positive attribute, it functions more as an expected feature than a primary purchase driver. The findings further reveal a functional perception gap in which consumers appreciate the aesthetic qualities of bamboo based products but remain uncertain about their practical durability. These results extend the application of Mere Exposure Theory in sustainable design contexts and highlight the importance of experiential exhibition environments in shaping consumer acceptance of bio based materials.

1. Introduction

This paper is based on the Mere Exposure Theory which indicates that the attitude towards a stimulus can be more positive due to repeated or incidental exposure to it. When the engineered bamboo products are displayed in a carefully designed exhibition setting, the consumers are provided to have a physical and visual feel of the material, which can have an impression and perception on the product. The modern world experiences even greater threats including depletion of resources, environmental pollution, and climate change that has rendered sustainable development and green consumption the burning issues on the global agenda (Joshi & Rahman, 2015). To address these issues, designers and manufacturers have paid greater attention to eco-friendly materials that have less impact on the environment but do not reduce the aesthetic quality and functional performance. Bamboo has also become one of the promising sustainable materials because of its rapid growth rate, regeneration, and large carbon-sequestration rate (Jalil, 2025).

In other areas like Sarawak where bamboo wood is so prolific and deeply rooted in the culture of the people, the production of engineered bamboo products is a significant challenge to enhance sustainable creative industries and cut down on the use of traditional timber and synthetic materials. Nevertheless, although bamboo in Sarawak has ecological benefits, there is still some perceptual stigma. It has also been seen as a material of underdeveloped aspects since it is mostly related to traditional crafts or temporary structures or applications with low costs in the rural areas (Jalil, 2025; Adnan et al., 2019). These impressions restrain the appreciation of bamboo as a possible design and high-value item constituent. The engineered bamboo, as opposed to raw bamboo, is treated through the usage of modern technologies which add to its structural stability, durability and versatility. The new technologies

allowed utilizing bamboo in a vast variety of contemporary design settings: furniture, interior design, and lifestyle accessories (Larasati, 2020). Even with these technical advances, the use of bamboo products in the contemporary consumer markets is not well-distributed.

Consumer perception is one of the major barriers. Bamboo has been labeled as a stigmatized material that belongs to the low-income group and temporary buildings, which also impairs the perceived value of the material in comparison with traditional products which include hardwood or metal (Das, 2023; Gao et al., 2024). Consequently, the consumers tend to be hesitant to pay high prices on bamboo products even when such products show a similar level of durability and aesthetic performance (De Julian Jr., 2023). According to previous researchers, the perceptions of value, product quality, and aesthetics are significant determinants of willingness to pay (WTP) by consumers of bamboo products (Wang, 2025). As an example, despite the high cultural value that Chinese consumers give to bamboo, the issue of durability and maintenance is also a factor that can prevent a purchase (Wang, 2025). However, consumers are ready to pay more in the market of creative products, where the products possess unique design value or artistic contrast (Kilic, 2022).

It is also proposed in research that consumers might be ready to pay higher prices to environmentally friendly products but it is also dependent on various psychological and situational issues (Jalil, 2022). Consumers who have higher values in green consumption levels (GCVs) will show more purchase intentions and more visual impact on the purchase of bamboo products than less sustainable products like plastic (Shi, 2025). In addition, the environmental concern has also been cited as a strong predictor of purchasing intention of bamboo textiles and its apparel (Jalil, 2025). However, even with the growing consciousness of sustainability, researchers all report a so-called green gap between positive environmental intentions and real purchasing behaviour (Biswas, 2020). This is a loophole indicating that sustainability does not necessarily need to be enough to influence consumer adoption. The other value signals, like quality of design, functionality, and modern appearance, are required to persuade the customers to shift to sustainable materials (Hwui and Jalil, 2025; Thogersen, 2022). Low quality and durability negatively stereotyped images also contribute to consumer reluctance towards bamboo products (Wang, 2025). Customers also have some worries on the maintenance of the product and whether modern bamboo designs can be compatible with their lifestyle (Jalil, 2025).

A low level of consumer knowledge regarding the qualities and characteristics of bamboo thus is one of the biggest hindrances to implementation. Nevertheless, the research shows that the interest of the consumers in the material doubles when they are educated about the functional and environmental advantages of bamboo, especially compared to less sustainable resources like plastic (Wang, 2025). Although consumers can be willing to pay a more sustainable or organic product a premium, there is much variation in their readiness to pay based on the perceived legitimacy of the premium price (Shaharuddin et al., 2021). The existing literature continues to show that even though environmental concern has a positive effect on the attitudes towards bamboo products, it does not often convert into the actual intention to pay unless accompanied by the notion of the product durability, aesthetics, and functional reliability (Biswas, 2020; Nguyen et al., 2024; Wang et al., 2025). This green gap continues to

raise awareness of the necessity to investigate the perceptual processes that help convert sustainability awareness into economic value. Thus, the proposed study explores the effect of exhibition exposure, which is based on the Mere Exposure Theory, on the perception of consumers and their readiness to pay in the engineered bamboo products. This study adds to the existing knowledge regarding the benefits of design-driven experiences in improving consumer acceptance of sustainable materials by analyzing the visual and tactile exposure and its relationship with perceived durability, aesthetic value, environmental perception, and willingness to pay.

2. Related Literature

Fashion and decorative products leadership plays an important role in the context of apparel, whereas economic, epistemic as well as emotional value of values are more important in other contexts (Jalil, 2025). The Mere Exposure Theory states that when a consumer gets exposed to a particular stimulus repeatedly, the attitude towards that stimulus would be increased (Januszczak, 1993). This is possible in the pretensive but incidental exposure in the case where the consumer does not process the information consciously (Janiszewski, 1993). The theory is applicable in the marketing and advertising industry where repeated low involvement exposure of the products made of bamboo over a variety of mediums may be an effective approach in creating positive perceptions (Janiszewski, 1993). The theory is very applicable in the context of changing consumer perceptions and raising WTP, the economic indicator of this shift in perception is called WTP (Jalil and Shaharuddin, 2019). Repeated exposure may lead to a product appearing familiar to consumers, and this factor may affect the consumer preferences in a positive way (Kim, 2025). Regarding green dining, it was revealed that simple exposure to green information was sufficient in order to make the participants more prepared to green foods (Hu, 2014). This is an indication that interacting with the creative bamboo products, which is repeated and passive, may develop positive attitudes and WTP in the long run. The actual behavior and purchase intention can also be moderated by the mere exposure effect. As an example, in the case of AI-based food delivery applications, mere exposure positively moderated the connection amidst the intention to use the application and real usage behavior (Kim, 2025).

According to Mere Exposure Theory, the more consumers see high-quality bamboo products in use, the less cognitive dissonance about the product's low value is reduced, replaced by familiarity and aesthetic value (Hagtvedt and Patrick, 2008). In this exposure process, exhibition markets are important. Compared with traditional retail experiences, exhibitions are immersive, curated experiences that enable consumers to touch products, see craftsmanship, and challenge preconceptions (Rinallo et al., 2017). According to Ju and Jung (2020), the experiential qualities of exhibitions have a considerable effect on buying intentions because they tangibly confirm product quality. Recent research indicates that environmental concern alone is usually insufficient to achieve premium pricing. According to Uddin et al. (2024), in the aquaculture business, local customers prefer tangible qualities such as freshness and size over purported sustainability, and income levels are a major limiting factor. Equally, Nguyen et al. (2024) found that perceived quality and aesthetic appeal are better predictors of WTP for bamboo products in the furniture industry than environmental altruism. Exhibition markets also offer good exposure settings

where consumers are able to touch with the bamboo products through repetitive observations and comparisons. Perceptual learning accompanies such exposure and makes the content less uncertain and stronger in terms of positive associations (Jalil, 2022). According to this, the Mere Exposure Theory is a suitable theory to analyse the impact of display on perception using engineered bamboo products and WTP as a result of the display.

The literature indicates that there is a positive association between the green consumption values and the WTP on the sustainable products including the bamboo products. As mentioned before, the Mere Exposure Theory is an effective theory when it comes to the perception of influencing consumer behaviour to purchase a product. The negative quality perceptions and establishing familiarity and positive affect might be achieved by exposing the consumers to creative and high quality bamboo products repeatedly. According to the theory, people are more likely to have a more positive attitude towards objects, materials, or designs they encounter every day without conscious consideration (Bornstein et al., 2022). Particular research gaps exist that can be identified in studies which focus on creative and innovative bamboo products in areas beyond the field of handicraft and furniture (Jalil, 2025). In a bid to close this perception gap, this paper draws on Mere Exposure Theory (Zajonc, 1968), which posits that familiarity, positive affect, and preference for a stimulus increase with repeated exposure, without any conscious judgment. Although it has been extensively used in advertising and branding (Fang et al., 2017), little to no research has examined its use in material-based design, particularly for bamboo products. In the case of engineered bamboo, early consumer reluctance to use the material is often due to cognitive doubts about its high-tech properties (Neha & Aravendan, 2023).

In consumer behaviour studies and design, mere exposure has been shown to play a role in aesthetic appreciation, perceived quality, and acceptance of novel products. Consumer hesitation regarding engineered bamboo products is usually due to a lack of familiarity, misassumptions about the value of durability, and uncertainty about what to expect (Jalil, 2025). To address such gaps, the present study will combine Mere Exposure Theory and consumer perception and willing-to-pay research to meet the research objectives of engineered creative bamboo products in the Sarawak exhibition markets.

Building on Mere Exposure Theory, this study proposes that exhibition exposure serves as an antecedent to consumer perception, which in turn influences willingness to pay (Jalil & Shaharuddin, 2019). In exhibition environments, repeated visual and tactile encounters with bamboo products are expected to reduce uncertainty, enhance perceived quality, and increase aesthetic appreciation. Consumer perception is conceptualised across three dimensions: perceived quality and durability, aesthetic and design appeal, and sustainability perception (Shaharuddin et al., 2021).

Prior awareness is expected to condition the magnitude of perceptual change, with consumers who possess lower initial familiarity exhibiting greater perceptual shifts following exposure. Functional suitability is introduced as a moderating variable, reinforcing the relationship between perceived value and WTP by addressing concerns related to usability and lifestyle compatibility.

The hypothesis put forward in this paper is that the exposure based on exhibitions is the mediator. Based on the previously conducted research on sustainable material acceptance and consumer valuation and the Mere Exposure Theory, the hypothesized conceptual model of the study will entail exposure in form of exhibitions influencing consumer perception, which in turn influences WTP. It has been said that prior knowledge is a conditioning factor that affects the magnitude of a perceptual change, whereas functional appropriateness and compatibility with lifestyle is a reinforcing factor that improves purchase-related consequences (Bornstein et al., 2022). Specifically, the perception of the bamboo products is heightened by the exposure to the exhibition in the three dimensions, quality and durability, aesthetics and design, and sustainability. All the perceptual indicators make consumers pay a premium price on the products made of bamboo base. The conceptual model thus brings exposure, perception and valuation in a coherent system that explains the impact of seeing the bamboo products in real world context to form a perception of that value. It is assumed that Exhibition Exposure (independent variable) influences Consumer Perception (mediator) which is quality, aesthetics, and sustainability, and that the perception also influences WTP (dependent variable).

H1

Exhibition-based exposure to engineered bamboo products positively influences consumers' perceived quality, aesthetic appeal, and sustainability value.

H2

Positive consumer perception of engineered bamboo products significantly increases WTP a price premium.

H3

Consumers with lower prior awareness of bamboo products experience greater positive perceptual shifts after exhibition exposure compared to those with higher initial familiarity.

H4

Functional suitability and lifestyle compatibility strengthen the relationship between the perceived value of engineered bamboo products and WTP.

This conceptual framework (Fig. 1) extends the Mere Exposure Theory to engineered creative bamboo products in exhibition markets, where the literature is lacking. The framework offers theoretical understanding and practical advice to designers, SMEs, and policymakers seeking to facilitate the creation of sustainable bamboo-based products in Sarawak's creative economy by combining perceptual dimensions, functional considerations, and WTP.

3. Methodology

The quantitative research design was used to determine consumer perceptions and readiness to pay engineered bamboo products at an exhibition setup. Sampling will be done based on a structured questionnaire where adult visitors to design and craft shows in Kuching, Sarawak, during November to December 2025 will complete the questionnaire. There were 135 valid responses that were retained to be analyzed. The convenience sampling proved to be the best choice because the study was exploratory and sampling in the exhibition facilities was limited by the practicality consideration. Although this method restricts generalisation, the method is suitable in studying the formation of perception in real-life experience conditions. The respondents did it on a voluntary basis and were told that the research was done as part of the academic work. After they watched the exhibition (Fig. 2) they were able to answer the survey.

The questionnaire had four parts, namely demographic data, previous awareness and familiarity, consumer perception (quality and durability, aesthetic appearance, sustainability), functionality suitability, and willingness to pay. Measurement of all items of the perception was based on the five-point Likert scale with 1 (strongly disagree) at one end up to 5 (strongly agree) at the other end. The items used in measurement were based on the previous research on sustainable consumption and WTP, with specific alterations on bamboo products. The analysis of the data was performed based on SPSS. The profiles and levels of perception of respondents were summarised using descriptive statistics. Internal consistency was measured as the Cronbach alpha in the process of reliability analysis. Pearson correlation used to determine the relationship between variables and multiple regression analysis was also used to determine the predictive relationship between the perception variables and willingness to pay.

4. Results

The sample comprised a balanced mix of male and female respondents, with the majority aged between 25 and 35 years. Most respondents were employed, and a substantial proportion reported monthly incomes below RM5,000, reflecting a price-sensitive consumer segment relevant to sustainable lifestyle products.

4.1 Bamboo Product Perceptions Descriptive Analysis

Table 1 shows the descriptive statistics of all the important constructs that will be involved in this study. On the whole, the findings indicate that consumers have quite positive attitudes to engineered bamboo products after the exposure to the exhibition. Aesthetic and design appeal were some of the measures of constructs that achieved the highest score with a mean of (M = 4.32, SD = 0.58) showing that Bamboo products were strongly perceived to be aesthetically pleasing and well-designed by the respondents. This was subsequently followed by intent to pay (M = 4.28, SD = 0.51), perceived quality and durability (M = 4.25, SD = 0.60) because of high confidence in the functional and economical value of the products manufactured out of bamboo. The sustainability perception also demonstrated a high mean score (M = 4.18, SD = 0.80), which means that an overwhelming majority of the respondents answered that bamboo

products are sustainable, and they are consistent with the principles of sustainable consumption. In the meantime, the functional suitability was rated at a comparatively lower mean (M = 3.64, SD = 0.95), which means that, although their overall optimism is present, the respondents remain rather uncertain about the possibility of the use of the bamboo products in practice, as well as whether they will be useful. All this data leads to the conclusion that the visuality, perceived longevity, and sustainability are one of the primary advantages of products made of bamboo, and that the functional aspect may require some extra support in the shape of design communication or product development.

Table 1
Descriptive Statistics of Study Variables

Construct	Mean	Std. Deviation
Prior awareness and familiarity	3.98	0.82
Perceived quality and durability	4.25	0.60
Aesthetic and design appeal	4.32	0.58
Sustainability perception	4.18	0.80
Functional suitability	3.64	0.95
Willingness to pay (WTP)	4.28	0.51

4.2 Reliability Analysis

The reliability analysis was conducted to assess the internal consistency of all multi-item constructs. Table 2 indicates that the Cronbach alpha values were between 0.71 and 0.78, well above the minimum required 0.60 suggested by Cronbach's alpha in exploratory and applied design research. The findings confirm that the prior awareness, perceived value, functional suitability, and WTP measurement scales have a satisfactory level of reliability and can be later correlated and regressed with other measurement scales.

Table 2
Reliability Analysis of Measurement Constructs

Construct	Cronbach's Alpha
Prior awareness	0.78
Perceived value (quality and durability, aesthetic and design appeal, sustainability perception)	0.74
Functional suitability	0.71
Willingness to pay (WTP)	0.75

4.3 Correlation Analysis

The Pearson correlation analysis was performed to analyse the relationships between the variables related to the perception and WTP the products with bamboo (Table 3). The results indicate that the need to pay has a significant positive correlation with the quality and durability of the perceived quality ($r = 0.82$, $p < 0.01$) as well as the aesthetic and design appeal ($r = 0.81$, $p < 0.01$). The results above indicate that consumers would be more ready to pay money on the product made of bamboo when they feel that it is durable. Moderate positive correlation was also found between sustainability perception and WTP ($r = 0.52$, $p < 0.01$) which emphasizes the role of environmental values in consumer buying behaviour. Strong correlations among the antecedent awareness, perceived quality and perceived sustainability revealed that familiarity enhances perceptual analysis. On the other hand, the value of functional suitability had a low non significant relationship with WTP indicating that functional suitability may not have a direct impact on purchase intention, except in the event when it is mediated by other value attributes like design and durability.

Table 3
Pearson Correlation Matrix ($p < .01$)

Variable	ES	DA	DU	PR	DC	PI
Prior awareness and familiarity	1					
Perceived quality and durability	0.49**	1				
Aesthetic and design appeal	0.34**	0.45**	1			
Sustainability perception	0.30**	0.34**	0.37**	1		
Functional suitability	0.06	-0.01	0.07	0.44**	1	
Willingness to pay (WTP)	0.52	0.81	0.82	0.39	0.09	1

4.4 Multiple Regression Analysis

Multiple Regression Analysis The data will be subjected to multiple regression analysis. The effects of the overall effect of the variables of perception on the WTP the bamboo products were assessed using a multiple regression analysis (Table 4). The regression model was statistically significant ($F = 301.20$, $p < 0.001$) and strongly explains the variation in WTP ($R^2 = 0.92$). This demonstrates the good model fit and highlights the utility of the proposed conceptual framework. Perceived durability ($\beta = 0.50$, $p < .001$) and design and aesthetic appeal ($b = 0.45$, $p<.001$) were the strongest predictors and reflected that functional confidence and visual quality strongly motivate consumer WTP. Environmental sustainability also demonstrated a statistically significant positive effect ($\beta = 0.05$, $p = 0.006$) in favor of the role of the environmental sustainability perceptions in consumer valuation. A positive, yet nonsignificant effect ($\beta = 0.04$, $p = 0.048$) was found with price consideration, which showed that higher price sensitivity has a limited and weak ability to reduce WTP, in particular among respondents with lower income. Intriguingly, the durability issue also created a low positive effect ($\beta = 0.04$, $p = 0.009$), which implies that the understanding of the durability problem may trigger the consumers to pursue more qualitative offers instead of directing their attention away in the purchasing process.

Table 4
Multiple Regression Results (Dependent Variable: Purchase Interest)

Predictor	β	t	Sig.
Environmental Sustainability	0.05	2.80	0.006
Design & Aesthetic Appeal	0.45	17.26	0.000
Perceived Durability	0.50	19.57	0.000
Price Consideration	-0.04	-2.00	0.048
Durability Concern	0.04	2.67	0.009

As shown in Table 5, the empirical results confirm all hypotheses except H4, which is partially confirmed. The findings substantiate that exposure to exhibitions promotes perceived value, and, as a consequence, WTP is significantly affected. Prior awareness contributes to perceptual shifts, while functional suitability plays a moderating role, albeit with partial strength, in the perceived value with WTP relationship.

Table 5
Summary of Hypotheses Testing

Hypothesis	Relationship	Result
H1	Exposure → Perceived Value	Supported
H2	Perceived Value → WTP	Supported
H3	Prior Awareness → Perceptual Shift	Supported
H4	Functional Suitability (Moderator)	Partially Supported

5. Discussion

The work as outlined in the Introduction aimed to look into consumer perception to engineered bamboo as an environmentally friendly material and to establish the key factors related to WTP with particular emphasis laid on sustainability, design, durability, and price. The following discussion will be grounded on the interpretation of empirical findings regarding the study conceptual framework, which is the Mere Exposure Theory, the sustainable consumption theory, and the principles of eco-design. As hypothesized, the statistically significant and positive effect of perceived environmental sustainability on WTP (β = 0.05, p = 0.006) was found and the overall sustainability perception of respondents was great (M = 4.18). This observation serves to confirm the earlier hypothesis that the relation between bamboo, its renewability and environmental responsibility has a positive influence on the consumer attitude. The rather small effect size, however, indicates an idea that the sustainability is not a major factor among purchase decisions but a requirement. This is in line with the current sustainability discussion, which belief the consumer endorsement of environmentally-friendly materials, sustainability is not an effective

buying concept unless complemented by other value elements. Thus, the findings reduce the initial hypothesis by indicating that sustainability must be part of strong product experiences as opposed to it being an independent ethical statement.

Among the most significant results of this paper, it is important to note the high impact of design and beauty on readiness to buy. Design appeal had the highest descriptive mean ($M = 4.32$) and was strongly correlated with WTP ($r = 0.81$, $p < 0.01$). The regression also showed that design was an important predictor ($\beta = 0.45$, $p < 0.001$). This finding is a very strong argument in favour of the design argument, as in the Introduction. It coincides with emotional design theory and design-driven innovation lenses, which also focus on the influence of visual appeal on the development of emotional appeal and perceived value. Applying to the case of bamboo products, these findings stop and negate the perceptions of bamboo as a utilitarian or traditional product. Rather, it shows that by introducing bamboo through the language of modernism and high-quality design, it becomes a viable and acceptable material for the modern consumer.

Perceived durability ($\beta = 0.50$, $p < 0.001$) was the best predictor of the WTP, with high mean score ($M = 4.25$), and high positive correlation ($r = 0.82$, $p < 0.01$). The observation backs the theoretical position of the study that the sustainability is viewed by the consumers in terms of environmental, functional longevity, and reliability. The other practical expression of sustainability based on the sustainable product longevity theory is durability that reduces replaceability and consumption of resources (Jalil and Shaharuddin, 2019). The differentiation of durability as one of the factors between the concept of sustainability and the actual implementation and consumption of the concept by the consumers makes this a critical variable in the study since it reveals that durability is a central concept in the adoption of sustainable materials. The price consideration was found to have statistically significant but relatively weak negative effect on WTP ($\beta = 0.04$, $p = 0.048$), which shows that respondents are willing to assess bamboo products on the value basis, as opposed to price sensitivity itself.

Even though the sample consisted primarily of the respondents according to their income, the mean of readiness to pay ($M = 4.28$) is so high that it indicates that consumers are willing to be willing to spend on the bamboo products as long as their design quality and durability are rated as high. This helps support the value-based consumption perspective that was discussed in the Introduction which dictates that sustainable products are more likely to succeed when their packaging is designed as value-based substitutes to the high-end products that are eco-niche products. Though the functional suitability was less rated with the lowest mean ($M = 3.64$), it played a moderating role to some extent in the conceptual framework. The two variables have a weak direct relationship as the budgetary association which means that functionality only partially determines the way perceived value is converted to economic intention. This observation means that usefulness is used in an indirect way to enhance faith in stability and application particularly after exposure during exhibitions. Still, on the same subject, they did not affect WTP significantly, whereas there were durability concerns, implying that the high appeal of the design and positive durability perceptions can prevent a strong appeal in the case of durability concerns. This

helps in the Introduction argument that uncertainty of other materials may be removed via design innovation, exposure, and material transparency.

Taken together, the findings will lead to empirical support of the hypothesized framework; that is, the perceived value is positively affected by exposure through exhibitions, and WTP is positively affected by perceived value. High explanatory power of the regression model ($R^2 = 0.92$) means that the general interaction of the sustainability perception with design appeal and durability determines consumer valuation of the engineered bamboo products. The current study, then, promotes the position that sustainable materials are more acceptable when they are included in the contemporary discourses of lifestyle and can seem viable. On the theoretical front, there are three contributions to the literature of the subject of this research. It starts by moving Mere Exposure Theory to a different dimension: material-based design products in an exhibition environment. Second, it demonstrates that exposure perceptual shifts can be reflected into economic behaviour, in the given case, WTP on sustainable materials. Third, the research offers a more detailed model of consumer decision-making in sustainable design by making the exposure-perception-valuation pathway more inclusive of functional suitability. The practical implication of the findings is that, in fact, exhibition locations are discerning perception spaces, rather than sale spaces. In order to get consumer recognition, trust, and value perception, designers and SMEs are advised to concentrate on frequent visual encounters, elevated aesthetic delivery, and narration of design. Exhibitions may also serve as strategic tools by policymakers and industry players to sell sustainable materials with emphasis laid on how well they can be functionally adapted, how they can be related to lifestyle and their sustainability stories. This research has weaknesses, although it has merits. The cross-sectional design is non-causal and the findings are localized to the Sarawak exhibitions. The second phase of research would embrace experimental or longitudinal research investigating the impacts of exposure both in both the short and long-term and in different cultural contexts. Furthermore, further studies may also address other problems, such as emotional responses, tactile sensation, and platforms of digital exposure to expand the application of the Mere Exposure Theory in the research of sustainable materials.

5.1 Practical Implications

The research provides highly important information to designers and SMEs that want to enter the sustainable luxury and lifestyle markets. In order to supersede the image or stigma of low-value rural resource to high-value and design-oriented biomaterials, perceived durability and modern aesthetic appeal should be ranked by the practitioners as the major sources of value. Exhibitions must not be used only as a sales point, but as a display of visual perception by arranging a sense of touch where the quality of the product is proved and the premium prices are justified. Additionally, since sustainability is a minimum expectation, market campaigns must incorporate environmentally friendly discourses in larger discourses about compatibility in lifestyles and technical dependability. The functional gap should be resolved by open communication about the structural stability of engineered bamboo to transform a strong aesthetic interest into a regular economic intent. The Sarawak government and the agencies like Sarawak Timber Industry and Development Corporation (STIDC), Sarawak Furniture Industry Association

Sarawak (SFIA), Sarawak Craft Council (SCC) and Sarawak Forestry must then take a concerted effort to ensure that engineered bamboo is more quickly adopted in the Sarawak creative economy. The government would need to create special Sustainable Material Experience Centres where people can be exposed to engineered bamboo innovations regularly and with high quality using the Mere Exposure effect to alter the consumer paradigm in the state. Rapid financial support should be channelled into Research and Development (R&D) grants specifically targeting demonstrative design; projects that visually and physically prove the functional longevity of bamboo to bridge the current scepticisms among local consumers.

6. Conclusion

The study was conducted to explore consumer perceptions on the use of engineered bamboo as a sustainable resource and what drives the WTP in the market, conditional on the exhibition in Sarawak. The study of exposure-perception-value relations to develop consumer awareness of the eco-friendly materials can be viewed as an in-depth study of the subject matter through the prism of Mere Exposure Theory and sustainable consumption and eco-design perspectives. These findings show that environmental sustainability has a positive influence on consumer attitudes; however, it is rather a background expectation rather than an overriding power in determining whether to buy the product or not. Instead, the most important motivators of WTP are perceived durability and design attractiveness, and the consumers focus on perceived sustainability in terms of functionality and beauty. These results indicate that sustainable materials can acquire a bigger market share in the case when they are perceived to be trustful, attractive, and corresponding with contemporary lifestyles. The price element was the secondary though a statistical element in that consumers would be ready to deal with middle-range price increases in the presence of good design and durability features, which reiterate the sustainability benefits. The principal success of this study is that the design-driven valuation construct has been empirically validated that exposure to an exhibition may amplify the perceived value and ensuing economic intention. The research contributes to the theoretical knowledge by using Mere Exposure Theory to design a material-based product, as it assists to comprehend how the perception of the material can be changed by means of repeated visual contacts and how this perception can modulate the wish to purchase a product. Functional suitability added further enlarges the existing definitions of sustainable consumption, which focuses on the significance of usability in the mediation process between perception and valuation. Practitioners In practice, designers, practices in the creative industry and policymakers are concerned with the results of the latter. The exhibition areas ought to be used as perception-making areas where the sustainable material is brought out via the high standard design, accurate functional narrative and lifestyle narrative. The chief considerations include durability, contemporary appearance and open communication in the case of the designers and SMEs and will contribute to giving the engineered bamboo products a high level of consumer confidence and acceptance of the products in the market. It is an excellent foundation of future research but it is cross-sectional and contextually focused that restricts the research. Future research can contribute to the knowledge of sustainable material adoption by investigating the longitudinal influence of exposure,

cross customs, and multisensory experience. In this paper, engineered bamboo is introduced as a design-oriented high-value mass that is environmentally friendly and is also an alternative material that can be utilized to allow the sustainable innovation in creative and manufacturing businesses.

Declarations

Consent to Participate

Informed consent was obtained from all participants prior to their participation in the study. Participants were informed about the purpose of the research, and their participation was voluntary and anonymous.

Consent for Publication

The authors confirm that the manuscript has not been published previously and is not under consideration for publication elsewhere. All authors have read and approved the final manuscript.

Funding statements:

The authors would like to express their sincere gratitude to Universiti Malaysia Sarawak, UNIMAS for the financial support provided for this research. This work was fully funded under the Creative Arts and Design Research Grant Scheme (DESIGN): UNI/I04/DESIGN/85883/2023, titled Exploring the Potential of Bamboo-based Product Design in Sarawak

Author Contribution

MHJ - Conceptualization; Methodology; Software; Formal Analysis; Investigation; Resources; Data curation; Writing Original draft; Visualization. VTJH: Investigation; Resources. FS - Validation, Investigation, Resources, Data curation, Reviewing and Editing, Supervision, Project Administration. SASH Visualization, Supervision. DGA Investigation: Resources.

Acknowledgement

The authors would like to express their sincere gratitude to Universiti Malaysia Sarawak, UNIMAS for the financial support provided for this research. This work was fully funded under the Creative Arts and Design Research Grant Scheme (DESIGN): UNI/I04/DESIGN/85883/2023, titled Exploring the Potential of Bamboo-based Product Design in Sarawak

Data Availability

The data is available upon request from corresponding author.

References

1. Adnan S, Nordin NA, Abu Bakar A. The Role of Craft Industry in Promoting Heritage Tourism in Malaysia. J Tourism Hospitality Culin Arts. 2019;11(1):1–14.
2. Biswas A. A Study of Consumers' Willingness to Pay for Green Products. J Adv Manage Sci. 2020;4(3):211–5.
3. Bornstein RF, Craver-Lemley C. Mere exposure effect. Cogn illusions. 2022;1(1):241–58.
4. Das M. Perception of Bamboo as a Building Material: A Study on the Stigma of 'Poor Man's Timber'. Int J Civil Eng Archit. 2023;14(2):45–58.
5. De Julian S Jr.. Price Sensitivity and Perceived Value of Sustainable Furniture in Developing Economies. J Global Mark. 2023;36(1):88–104.
6. Fang X, Singh S, Ahluwalia R. An Examination of Different Explanations for the Mere Exposure Effect. J Consum Res. 2017;34(1):97–103.
7. Gao M, Cao X, Qian L. Cultural Echoes in Modern Design: Assessing Young Consumers' Perceptions of Traditional Bamboo Weaving Patterns. Complexity. 2024;2(1):449–60.
8. Hagtvedt H, Patrick VM. Art Infusion: The Influence of Visual Art on the Perception and Evaluation of Consumer Products. J Mark Res. 2008;45(3):379–89.
9. Hu MLM, Horng JS, Teng CC, Chiou WB, Yen CD. Fueling Green Dining Intention: The Self-Completion Theory Perspective. Asia Pac J Tourism Res. 2014;19(7):793–808.
10. Hwui KCQ, Jalil MH. Reimagining Indigenous Material Culture: Exploration and Utilizing Bamboo as a Sustainable Approach in Contemporary Costume Design–A Case Study on Marik Empang Beadwork. Asian J Arts Cult. 2025;25(3):e287056–287056.
11. Jalil MH. Eco-fashion design-a review. Int J Sustain Design. 2022;4(3–4):205–33.
12. Jalil MH. Weaving a Greener Tomorrow: A Mini Review of Bamboo Fiber, Textiles, and Hand-woven Techniques for Sustainable Innovation. Pertanika J Sci Technol. 2025;33(3):1661–82.
13. Jalil MH, Shaharuddin SS. Consumer Purchase Behavior of Eco-Fashion Clothes as a Trend to Reduce Clothing Waste. Int J Innovative Technol Exploring Eng. 2019;8(12):4224–33.
14. Joshi Y, Rahman Z. Factors Affecting Green Purchase Behaviour and Future Research Directions. Int Strategic Manage Rev. 2015;3(1):128–43.
15. Ju M, Jung H. Experience Satisfaction and Buying Intention of Exhibition Experience: The Mediating Role of Perceived Value. J Syst Manage Sci. 2020;10(2):40–55.
16. Kilic AS, Duran C. Do consumers with high need for uniqueness pay more? a study of the relationship between consumer need for uniqueness (CNFU) and willingness to pay (WTP). Res J Bus Managent (RJBM). 2022;9(3):172–83.
17. Kim S, Priluck R. Consumer Responses to Generative AI Chatbots Versus Search Engines for Product Evaluation. J Theoretical Appl Electron Commer Res. 2025;20(2):93.

18. Larasati D. Sustainable Bamboo Furniture: Design and Technology. For Prod J. 2020;70(3):210–8.
19. Neha P, Aravendan M. A Review on Sustainable Product Design, Marketing Strategies, and Conscious Consumption of Bamboo Lifestyle Products. Intell Inform Manage. 2023;15(3):67–99.
20. Nguyen NT, Le TH, Hoang DP. Factors Influencing Purchase Intention of Bamboo-Based Interior Products: The Role of Aesthetics and Durability. Int J Sustainable Dev Plann. 2024;19(2):445–56.
21. Rinallo D, Bathelt H, Golfetto F. Economic Geography and Industrial Marketing Views on Trade Shows: Collective Marketing and Knowledge Codification. Ind Mark Manage. 2017;63:53–66.
22. Shaharuddin SS, Jalil MH, Moghadasi K. Study of mechanical properties and characteristics of eco-fibres for sustainable children's clothing. J Met Mater Minerals. 2021;31(2):19–26.
23. Shi R, Qiao T, Liu C, Chen Z. An Eye-Tracking Study on the Impact of Green Consumption Values on the Purchase Intention of Bamboo Products Under the Background of Replacing Plastic with Bamboo. Behav Sci. 2025;15(9):1162.
24. Thøgersen J. Unpacking the Green Gap: The Role of Habit and Social Norms in Sustainable Consumer Behaviour. J Clean Prod. 2022;340:130882.
25. Uddin MT, Roy S, Dhar AR. Consumers' Attitudes Towards Prawn Consumption in Bangladesh: An Investigation on Perceived Value and Willingness-to-Pay. Fishes. 2024;9(11):429.
26. Wang J, Md Hashim A, Azizan HA, Li Z. (2025). Decoding Chinese Consumers' Ambivalent Attitudes And Usage Intentions Toward Bamboo Furniture. J Tourism Hospitality Environ Manage (Jthem), *10*(41).
27. Zajonc RB. Attitudinal Effects of Mere Exposure. J Personal Soc Psychol. 1968;9(2):1–27.

Figures

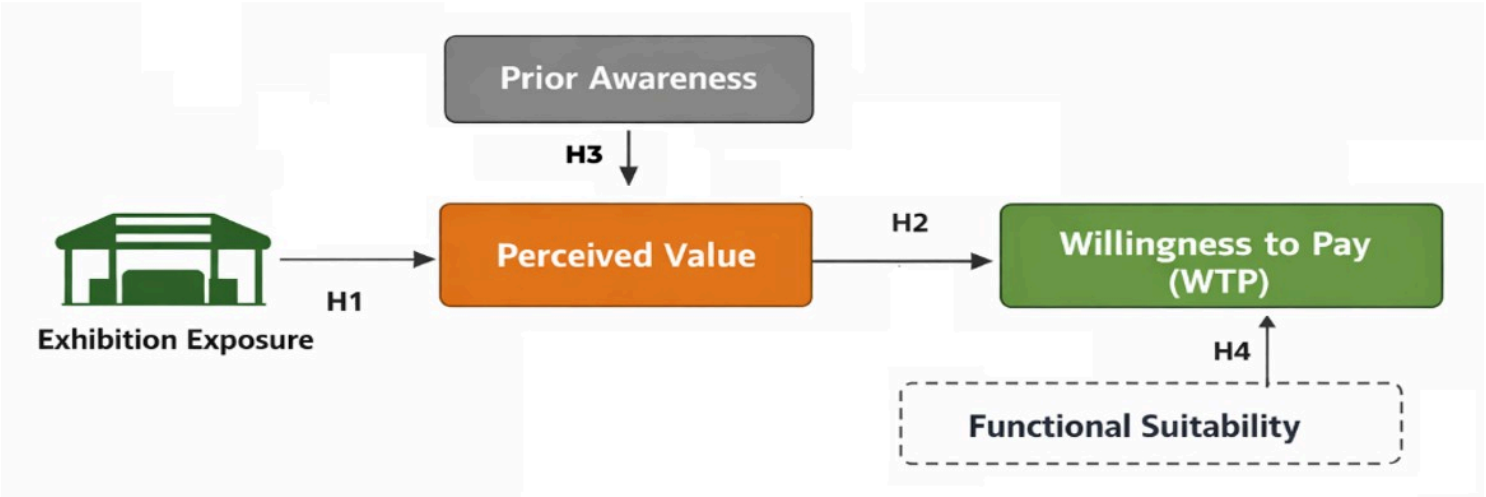

Figure 1

Proposed conceptual framework



Figure 2

Bamboo products exhibition