



Design for Aesthetic Pleasure

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Abstract. The theoretical articulation of functionalism has been a dominant influence in modern industrial design. Though practical function of a product is always the industrial designer's main concern, aesthetic effect is still a critical issue for the development of a new product. How a product was perceived as pleasurable? Jordan (1998) in a study titled "Human Factors for Pleasure in Product Use" concluded eight pleasure factors: (1) Security, (2) Confidence, (3) Pride, (4) Excitement, (5) Satisfaction, (6) Entertainment, (7) Freedom, and (8) Nostalgia. Through the quantitative investigation, this study intends to construct an accessible criticism model of cultural creative products based on the perspective of Jordan's theory. The framework provides a foundation for design industries to establish design strategies.

Keywords: Aesthetic pleasure · Product design

1 Introduction

The theoretical articulation of functionalism has been a dominant influence in modern industrial design. Though practical function of a product is always the industrial designer's main concern, aesthetic effect is still a critical issue for the development of a new product.

The Taiwanese government has been aggressively promoting culture creative industries in recent years. The goal of this policy is to develop a new economic model and better the living environment through attracting consumers with cultural products and aesthetic experiences. Many studies pointed out that designing products which emphasize local features to increase their cultural value has become a significant facet of the design process [8].

In addition to mass production products, handicrafts are very important articles for daily life. Crafts industries have become one of the most significant domains in culture creative industries of Taiwan. The exquisite techniques and various materials combine to form a typical aura of craftsmanship, through which to attract the public. According to Culture Statistics Report published by Ministry of Culture, the crafts industries

created a revenue of 77,289,767 thousand NT dollars in 2017 as shown in Fig. 1 [9]. It was ranked number five among all 15 domains of cultural creative industries of Taiwan.

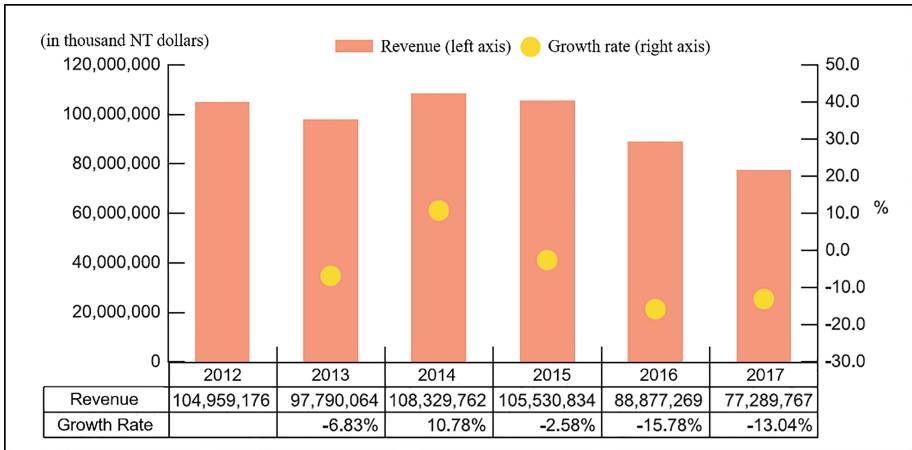


Fig. 1. Annual revenue and growth rate of Taiwan crafts industries 2012–2017

Among all fields of different materials, the products of wooden crafts had an excellent performance in the same year as shown in Table 1 [9].

Table 1. Annual revenue and growth rate of Taiwan wooden crafts industries 2012–2017

Year	2012	2013	2014	2015	2016	2017
Revenue	72,267	77,475	105,770	127,476	110,267	117,908
Growth rate		-7.21%	36.52%	20.52%	-13.50%	6.93%

(in thousand NT dollars)

Wooden crafts have typical attractions. Most of the people were fascinated by the natural texture of woods. One could hardly resist the varied colors, beautiful grains and distinctive scents of wooden products.

2 Research Purpose

The Fig. 2 shows a set of wooden crafts created by Po-Hsien Lin, one of the authors of this paper. The technique applied in these products is called woodturning, which was employed the wood lathe machine, the instrument designed specially for creating objects of symmetry about the axis of rotation.



Fig. 2. Wooden crafts created by Po-Hsien Lin



Fig. 3. The assemblage and the parts of the works (Color figure online)

This set of wooden crafts is an imitation of human figure. Four different woods were used in this set of works. The heads with bright color is Corkwood, the brown wood is Formosan Michelia, the red color is Rosewood, and black wood is Ebony. They could be taken apart and used as a sectional container (Fig. 3).

Though these products are functional, a common response of the first glance at these works is “cute”. Many beholders expressed their appreciations because of the pleasure derived from the works. How a product was perceived as pleasurable? What elements of a work could be the main factor that resulted in viewers’ preference?

The purpose of this study is to construct an accessible criticism model of cultural creative products. The framework provides a foundation for design industries to establish design strategies. An aesthetic paragon connecting to cultural context is addressed based on the output of the study, through which to promote aesthetic value of Taiwanese modern cultural products, enhances aesthetic literacy of the people.

3 Literature Review

3.1 A Historical Exploration of the Theories of Pleasure

In the book “Design for the Real World,” Papanek (1971) brought up the idea of “Function Complex.” He announced six parts of the function complex, including method, use, need, telesis, association, and aesthetics [11]. In Norman’s (2002) book “Emotional Design”, he suggested three critical components of product design: usability, aesthetics, and practicality [10].

Nevertheless, when aesthetics was addressed in the practice of design, it usually referred to beautiful appearance. Two thousand years ago when discussing the topic of “beauty” in his “Major Hippias”, Plato emphasized that he intended to explore “what beautiful is” instead of “what is beautiful” [12]. Plato’s argument lifted the discussion of beauty up to the level of a philosophical inquiry. Aesthetics becomes a convention discipline of “the branch of philosophy dealing with such notions as the beautiful, the ugly, the sublime, the comic, etc., as applicable to the fine arts...the study of the mind and emotions in relation to the sense of beauty” [1].

During the eighteenth century, some empiricist philosophers such as Edmund Burke and David Hume established their aesthetics theories stressing the connection between sense of beautiful and sensational pleasure [3, 5]. Based on the empiricist aspect of beauty, a product demonstrates its aesthetic feature by evoking users’ feelings or emotions of pleasure. Design for pleasure should therefore be a significant approach to create aesthetic value of a product.

3.2 Contemporary Discussions of Pleasure in Product Design

How a product was perceived as pleasurable? Jordan (1998) in a study titled “Human Factors for Pleasure in Product Use” concluded eight pleasure factors: (1) Security, (2) Confidence, (3) Pride, (4) Excitement, (5) Satisfaction, (6) Entertainment, (7) Freedom, and (8) Nostalgia. He also suggested seven displeasure factors: (1) Aggression, (2) Feeling Cheated, (3) Resignation, (4) Frustration, (5) Contempt, (6) Anxiety, (7) Annoyance [7].

Jordan’s study evoked many scholars engaged in further exploration of pleasure in design. In Taiwan, Chang and Wu developed a scale for the assessment of consumer pleasure evoked by appearance of products. He extended 17 items for the assessment of consumer pleasure. Chang conceived some pleasure factors based on consumers’ practical actions such as “I would like to share this product with others”, “I feel I want to have this product”, and “I like to play with this product” [2].

In a study on cognition of pleasure images, Hsiao and Chen conducted a factor analysis to reduce 17 items into four factors of emotional effects of pleasure including relaxed & humorous, reliable & familiar, attractive, and behavioral [4].

Based on the perspective of pleasure theories and empirical approaches of cognition inquiry, a questionnaire was developed to obtain information required for this study.



4 Research Methodology

4.1 Research Instrument

This study intends to construct an accessible criticism model of cultural creative products with an emphasis of the pleasure in products design. Based on the perspective of Jordan's theory, a questionnaire of the five-point scale was developed to examine Jordan's eight human factors for pleasure in product use.

Another four questions were designed to explore participants' general impression to the products (Table 2).

Table 2. Five points scale of pleasure attributes and impression assessment of the product

	descriptions	1	2	3	4	5
	Security	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Confidence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Pride	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Excitement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Satisfaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Entertainment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Freedom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Nostalgia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Degree of technique demonstrated in the product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Degree of creativity demonstrated in the product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Degree of pleasure when contemplating the product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Preference of the product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4.2 Research Stimuli

As for the selection process of the research object, the products were chosen from a set of wooden crafts created by Po-Hsien Lin. In order to have an in-depth exploration of participants' reactions to the stimuli, a statistical technique of "Conjoint Analysis" was employed in this study.

Conjoint analysis is a survey-based tool of SPSS used in market research for developing effective product design. It helps to determine what product attributes are important or unimportant to the consumer? What levels of product attributes are the most or least desirable in the consumer's mind [6]?

Based on the prior observation on viewers' reactions to the works, three basic attributes were considered to be the important components for constructing the profile of the works. The first is the color of the material, which is separated into three levels of brown, red, and black. The second is the proportion of the form, which is divided into two levels of tall and stout. The third is the shape of the curve, including two levels of rectangle and round. As shown in Table 3, the information presents a fraction of all

possible combinations of the factor levels, which is an orthogonal array designed to capture the main effects for each factor level [6].

Based on the data of Table 4, an ‘‘Orthogonal Design’’ procedure was conducted in SPSS. The program randomly generated a ‘‘Card List’’, which is a reduced set of product profiles that is small enough to include in a survey but large enough to assess the relative importance of each factor.

Table 3. Basic attributes of the works

Attributes	Levels
Color	Brown
	Red
	Black
Proportion	Tall
	Stout
Shape	Rectangle
	Round

Table 4. Card List generated for conjoint analysis

Card list			
Card ID	Shape	Proportion	Color
1	Round	Stout	Brown
2	Round	Tall	Black
3	Rectangle	Stout	Black
4	Rectangle	Tall	Brown
5	Rectangle	Tall	Red
6	Round	Stout	Red
7	Rectangle	Stout	Brown
8	Round	Tall	Brown

After obtaining the card list, eight products were selected from Lin’s works as shown in Fig. 4. A survey was added in the questionnaire asking respondents to rank product profiles by order in accordance their preferences for the works.

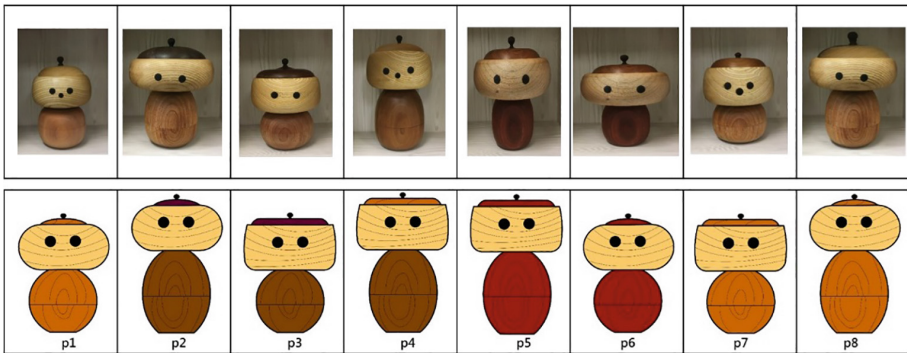


Fig. 4. Eight chosen products in accordance with the card list generated by SPSS

5 Research Results and Data Analysis

5.1 Conjoint Analysis for Relative Importance of Each Attribute of the Products

The importance of attributes of the products was summarized from the results of conjoint analysis as shown in Table 5 and Fig. 5. The outcomes of the statistics exhibited that the conjoint model performed in this study was considerably fit. Pearson’s R was .935 ($p < .001$) and Kendall’s tau was .857 ($p < .01$). All three attributes affected consumers’ preference. The most important attribute is color (49.5%), while less important attributes are proportion (26.7%) and shape (23.8%). The relative importance of each attribute was calculated from the utilities given in Table 5 and Fig. 6.

In regard to the overall utility of color, the statistics data suggested that black wood was preferred among the other attribute levels ($r = .582$). As for the proportion and shape, stout ($r = .378$) was more preferred than tall and round ($r = .087$) was more preferred than rectangle.

Table 5. Importance value and utility of the attribute levels

Factor	Level	Utility	Importance value
Color	Brown	-.327	49.482
	Red	-.255	
	Black	.582	
Proportion	Tall	-.378	26.715
	Stout	.378	
Shape	Rectangle	-.087	23.804
	Round	.087	
Pearson’s R: .935***		Kendall’s tau: .857**	

** $p < 0.01$ *** $p < 0.001$

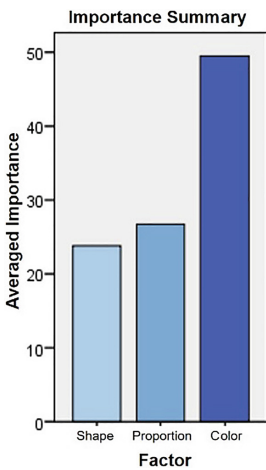


Fig. 5. Average importance of product attributes (Color figure online)

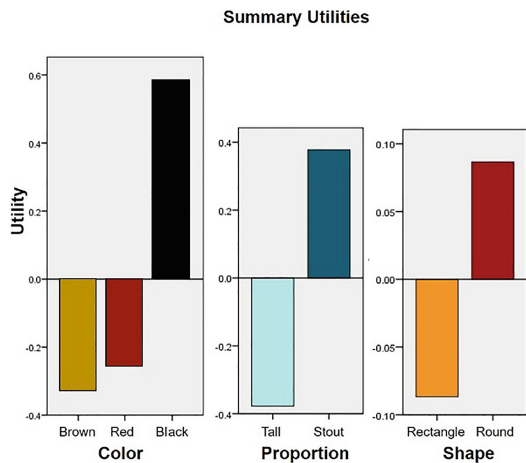


Fig. 6. Preference levels associated with color, proportion, and shape (Color figure online)

5.2 Factor Analysis of Pleasure of the Products

Based on the perspective of Jordan’s theory, this study explores viewers’ response of pleasure to the selected products. An exploratory factor analysis (EFA) was conducted to search for latent variables within eight items of pleasure. Two factors were extracted with eigenvalues greater than 1.0 and total variance explained 64.579 as shown in Table 6. The first dimension included three items of Pride, Excitement, and Confidence. The second dimension included five items of Security, Freedom, Satisfaction, Entertainment, and Nostalgia. The first group of emotions tend to be strong and aggressive. The second group of emotions tend to be mild and passive.

Table 6. Factor analysis for pleasure attributes

Item	Factor Loading		Communalities	
	f1	f2	f1	f2
Pride	.931	-.009	.867	
Excitement	.905	.149	.842	
Confidence	.761	.383	.726	
Security	-.069	.933		.875
Freedom	.170	.741		.578
Satisfaction	.414	.529		.452
Entertainment	.382	.382		.291
Nostalgia	.066	.202		.045
Eigenvalue	2.796	1.868		
% of Variance	38.712	25.867		
Cumulative %	38.712	64.579		

A basic descriptive statistics set was computed to examine how the respondents react to Jordan’s eight items of pleasure in this study. The outcome shows that the first three are Satisfaction, Entertainment, and Freedom. The factors of aggressive emotion tend to be less than those of passive emotion (Table 7).

Table 7. Descriptive statistics for the factor and item of pleasure s

Factor	Item	Descriptive statistics		
		Item mean	SD	Factor mean
Aggressive	Pride	3.40	1.067	3.38
	Excitement	3.41	1.079	
	Confidence	3.33	1.068	
Passive	Security	3.31	1.084	4.00
	Freedom	4.04	.815	
	Satisfaction	4.41	.788	
	Entertainment	4.33	.747	
	Nostalgia	3.92	.886	

5.3 Eight Items of Pleasure to Predict Degree of Products Preferences

To explore how eight items of pleasure affected the respondents' reaction when reviewing the products, this study conducted multiple regression analyses, taking eight items of pleasure as independent variables and the participant's degree of preference to the products as a dependent variable. The multiple regression model with all eight predictors produced $R^2 = .715$, $F = 12.571$, suggesting a statistically significant association between independent variables and the dependent variable ($p < .001$). As can be seen in Table 8, all seven items, except Nostalgia, have significant correlations between the degree of preference. Freedom and Satisfaction had significant positive regression weights, indicating the product with higher scores on these two items was expected to have the strongest degree of preference.

Table 8. Multiple regression analyses for pleasure attributes to predict preference of the product

Independent variable	Predictor variable	B	r	β	t
Preference of the product	Security	-.099	.297**	-.133	-1.183
	Confidence	.085	.485***	.112	.835
	Pride	.136	.470***	.178	1.187
	Excitement	.036	.517***	.048	.319
	Satisfaction	.235	.610***	.229	2.080*
	Entertainment	.000	.418**	.000	-.008
	Freedom	.608	.735***	.613	5.342***
	Nostalgia	.011	.159	.012	.141
	R = .846		R ² = .715	F = 12.571***	

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Taking eight items of pleasure as independent variables and the participant's overall degree of pleasure to the products as a dependent variable. The multiple regression model with all eight predictors produced $R^2 = .678$, $F = 10.513$, suggesting a statistically significant association between independent variables and the dependent variable ($p < .001$). As can be seen in Table 9, all seven items, except Nostalgia, have

Table 9. Multiple regression analyses for pleasure attributes to predict degree of pleasure

Independent variable	Predictor variable	B	r	β	t
Degree of pleasure when contemplating the product	Security	-.052	.327*	-.073	-.611
	Confidence	.042	.445**	.058	.406
	Pride	.103	.415**	.142	.888
	Excitement	.085	.489***	.120	.753
	Satisfaction	.203	.599***	.209	1.784
	Entertainment	-.098	.346**	-.096	-.877
	Freedom	.602	.731***	.640	5.240***
	Nostalgia	-.014	.126	-.016	-.175
	R = .823		R ² = .678	F = 10.513***	

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

significant correlations between the degree of pleasure. Freedom is the only item which had significant positive regression weights.

Taking two factors of pleasure emotions as independent variables and the participant’s overall degree of pleasure to the products as a dependent variable, the multiple regression model with two predictors produced $R^2 = .487$, $F = 21.807$, suggesting a statistically significant association between independent variables and the dependent variable ($p < .001$). As can be seen in Table 10, both factors have significant correlations between the degree of pleasure. Additionally, both factors had significant positive regression weights. Passive emotion shows greater effect than Aggressive emotion.

Table 10. Multiple regression analyses for pleasure factors to predict degree of pleasure

Independent variable	Predictor variable	B	r	β	t
Degree of pleasure when contemplating the product	Aggressive emotion	.241	.507***	.300	2.608*
	Passive emotion	.715	.641***	.522	4.539***
	R = .698		R2 = .487	F = 21.807***	

* $p < 0.05$ *** $p < 0.001$

Taking three items of technique, creativity, and pleasure as independent variables and the participant’s overall degree of preference to the products as a dependent variable. The multiple regression model with all three predictors produced $R^2 = .790$, $F = 56.543$, suggesting a statistically significant association between independent variables and the dependent variable ($p < .001$). As can be seen in Table 11, all three items have significant correlations between the degree of preference and had significant positive regression weights.

Table 11. Multiple regression analyses for product features to predict degree of pleasure

Independent variable	Predictor variable	B	r	β	t
Preference of the product	Skill	.329	.829***	.352	2.872***
	Creativity	.334	.842***	.406	3.235***
	Pleasure	.209	.788***	.199	1.665***
	R = .889		R2 = .790	F = 56.543***	

*** $p < 0.001$

6 Conclusion and Recommendations

6.1 Discussion of Findings

This study used the perspective of Jordan's theory on human factors for pleasure in product use to examine how customers perceived pleasure of products, and the connection between pleasure and appreciation of products. Discussed below are some important findings:

1. Through an evaluation to explore how eight items of attitudinal pleasure affected the respondents' reaction when reviewing the products, the outcome showed that all seven items, except Nostalgia, have significant correlations between their integrated perception of pleasure. Jordan's theory of pleasure in product offered a sufficient support in this study.
2. In this study, Jordan's eight items of pleasure were further reduced to two groups of distinct emotions through an Exploratory Factor Analysis. The first group of emotions tend to be strong and aggressive, including Pride, Excitement, and Confidence. The second group of emotions tend to be mild and passive, including Security, Freedom, Satisfaction, Entertainment, and Nostalgia.
3. Both aggressive and passive emotions have significant correlations between respondents' integrated perception of pleasure when contemplating the products, however passive emotion shows greater effect than that of aggressive emotion.
4. Through an evaluation to explore how eight items of attitudinal pleasure affected the respondents' attitude toward the products, the outcome showed that all seven items, except Nostalgia, have significant correlations between their preference of the products. Among eight pleasure items, Freedom and Satisfaction shows greater effect than that of the other.
5. This study conducted a survey asking respondents to rank product profiles by order in accordance their preferences for eight pieces of selected works. The outcome of a Conjoint Analysis demonstrated that three basic attributes of color, proportion, and shape affected consumers' preference. Among these three attributes, color is the most important item. A further analysis suggested that in this study the participants tend to selected black, stout, and round woodturning works.
6. Through Multiple Regression Analysis, this study employed participants' perception of technique, creativity, and pleasure demonstrated in the products to predict their degree of preference. The outcome showed all three predictors have significant correlations between the degree of preference. Among three elements, the effect of creativity is greater than technique, and pleasure is less important than the other two items.

6.2 Conclusion

This study attempted to employ Jordan's theory of pleasure in product to explore the connection between reviewers' attitudinal pleasure and preference of the products, trying to answer how a product was perceived as pleasurable.

In order to construct an accessible criticism model of cultural creative products with an emphasis on the pleasure in products design, this study use eight pieces of wooden craft as research stimuli. Though Jordan's theory offered a sufficient support in this study, a further finding suggests that passive emotion (security, freedom, satisfaction, entertainment, and nostalgia) could have a stronger effect than aggressive emotion (pride, excitement, and confidence) to evoke human factors for pleasure in products.

The characteristics of the handicraft could evoke different sensations of pleasure compared to those of the industrial product. Nevertheless, the finding is valuable for the development of craft industries. In addition to creativity and technique, pleasure is a very important attribute for a cultural creative product. This study also employed Conjoint Analysis as an instrument to explore consumer's concerns about product attributes. Through a full-profile approach, this study demonstrated a practical model for investigating different preferences met by distinct product offerings.

Whether pleasure is an objective attribute of an object or a subjective sensation of the viewers has been a dilemma in the field of aesthetics. An in-depth discussion of this topic could be very philosophical. However, many modern theories of cognitive psychology and neuroscience are very helpful in the related research. A further study of applying these new scientific domains to investigate the topic about pleasure in product design is strongly suggested.

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