

ICH 2019**International Conference on Humanities****DESIGN MEASUREMENT FOR FOOD PACKAGING DESIGN:
A DESIGN DEVELOPMENT**

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Abstract

Design quantification occurs not only in the field of industry, but also academic. In order to fulfil the end-users needs, the significance of design quantification must be empirically comprehended. Product test, experimental stimulus and sampling procedures are among the methods that have been applied in this study. This study also acknowledges the relevant opinion of individuals who possess design awareness in offering design measurement method to quantify design and visual representation. Centrality Visual Product Aesthetics (CVPA) is a measurement that encounters four (4) values for design analysis. The sampling procedures took place with selected population that consist of design students. These selected students are the visualising consumers for packaging design. Thus, it is reported they attend more towards to visual design elements that make them have better preferences in making product choices. The design framework of this study focuses on the ninth goal in promoting the industry, innovation, as well as infrastructure by utilising a quantitative methodology in order to accomplish the United Nation's Sustainable Development Goals. The results show that people with design sensitivity have stronger experiences and perceived values towards an aesthetic product. This design measurement has the possibility of the integration of a design process, particularly for an aesthetically pleasing sustainable packaging design.

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1. Introduction

Packaging, in general, can be categorised into three primary levels, i.e. primary packaging, secondary packaging, and tertiary packaging. With different usage of materials that cater to different purposes, packaging and its design serve numerous benefits both to the manufacturers and also to the end-users. For instance, package design is one of the strategies end-users, i.e. the consumers, use in their purchasing activity, which allows them to make interpretations about the product and the brand. Correspondingly, Fast-Moving Consumer Goods (FMCG) product categories have shown evidence of a minimal distinction between the products of the same categories. Therefore, consumers rely on packaging design elements to evaluate the product. The design of the package was reported to profoundly influence the sensitivities of the product through various behaviours (Magnier et al., 2016). Previously, looking at the aspect of ecologically-designed packaging, design considerations of the importance of new packaging design contributions is needed to establish knowledge that can be applied to enhance packaging design. The ability of consumers to recognise the stimulation of their options for particular packaging design is an essential measure to meet holistic perspectives.

Four (4) elements of packaging design essential in brand creation for marketing purposes had been distinguished. These specific elements are packaging attributes, packaging, or food product benefits, values, and personality (Wajitragum, 2014). Silayoi and Speece (2007) have also identified some elements of the differences in cognitive psychology. It has been suggested that these different mental processing systems may vary concerning the handling of verbal and pictorial inputs. Thus, the identified verbal descriptions may be inadequate when the design, styling, or products play an essential character in consumer's options that require the integration of visual elements. The usage of pictorial the presentations would likely enhance task practicality and peripheral validity in product categories. The possibilities of product or packaging design are strongly dependent on visual assessments. Assessing all of these elements are necessary as the link between the display of prints and images on several parts of a package can be explored. Thus, graphic display functions as one of the communication aspects of packaging design.

1.1. Centrality Visual Product Aesthetics

Centrality Visual Product Aesthetics, which is also known as CVPA, is a measurement of the consumer's perception of a product design and packaging design. To be exact, CVPA is merely to measure the individual differences derived from the characteristics that influence the consumer's tastes. Bloch et al. (2003) developed a scale that designates the definition of the level of significance that visual aesthetic holds between consumers, who are the end-users, with their relationship with the products. Comprehending that product design covers a wide definition, which may incorporate an extensive scope of relatable engineering aspects, is vital. These include product ergonomics, effectiveness, quality, reusability, and dispersal facility which take into account aesthetics.

Overall, eleven (11) items were developed, where the elements were derived from three (3) domains. The domains can be classified as i) perceived qualities derived from great completion of product design; ii) capacities in comprehending and assessing product design, and iii) level of feedback or feel of product texture. Personal values are highly related to attitude and behaviour. Accordingly, these attitudes could

rationalise consumers' traits and characteristics. Based on these values, one's behaviours could be explained through signifying features (traits) or values. The values are more likely to identify the rationale for options of a specific product, packaging design, or actions as genuine or worthy (Bunnak, 2009).

Knowledge of visual aesthetics may influence consumers' perception in many ways, according to the understanding of CVPA. For instance, most of the superior designs in the market distinguish their products from their competitors at the advantage of gaining more recognition. In addition, Berghman and Hekkert (2017) reported that the products perceived beauty contributed to their usability, and this has initiated academic interest. The "aesthetically" product categories that have been mentioned by the two authors are not restricted to product categories, but also include food packaging that may also have an aesthetic impact. Celhay and Trinquencost (2015) found that although the product and its design appearance are important, there are also consumers who prefer familiar packaging. Thus, the CVPA scale was applied in this study to identify individuals who tend to position visual appearance as highly relevant.

1.2. Personal and Social Values of Design in CVPA

This paper presents the measurement of the facet or dimension of the Personal and Social Values of Design. This facet or dimension is an element comprising CVPA that perceive the value of visual product aesthetics. According to Bloch et al. (2003), this particular dimension is a means of enhancing the quality of life, both personally and for society in general. As an individual measure, this dimension exhibited that consumers with high CVPA tend to acknowledge beautiful objects positively. The quality in their everyday lives, along with a positive influence, allow them to achieve a higher satisfaction level of needs. Consumers will potentially highly value a beautiful product or an aesthetically pleasing design. It shows that the consumers are on another level based on the way they perceive packaging design. In addition, consumers with high visual aesthetics centrality tend to believe that any beautiful design has a great value to society, which brings the quality of life. It seems that this perceived quality of life is affected by the quality of the design environment. Thus, the values assessed in this article were: i) Possessing products which contain great packaging designs causes me to feel good internally; ii) I find pleasure in appreciating displayed food products that contain great packaging designs; iii) I find delight in a packaging design, and iv) Nice packaging design improves the world we are living in.

2. Problem Statement

To understand that packaging design is important, as it has the potential to improve the efficiency of the best design, the consideration of the value in the designing process is crucial. However, the lack of understanding of functions, features, information, and cost of the packaging has resulted in a limited ability, affecting the early stages of the product or packaging design process. Packaging design has also been isolated from the core product development processes (Olsson et al., 2011), whereby the design process itself would comprise several issues. Although previous research has shown that the impact of product sustainability on perceived quality is positive, there are still exceptions. For example, food products have encountered an adverse effect due to the 'organic claim' logo that appears on the packaging. This particular logo seems to be perceived as reducing the amount of enjoyment and pleasure. On this finding, Magnier et

al. (2016) also established positive literature claiming that organic products are associated with perceptions of a higher quality as they tend to be perceived as healthier and tastier. Food packaging offers a long-term effect. Although the quality can be perceived through the package design, the influence of packaging and sustainability has to be determined.

The perceived different values and understanding of the significance of the packaging design is due to the varied backgrounds of the consumers. As such, SIRIM that acts as the Malaysia Standard and Industrial Research Institute had developed a business model to assist the microenterprise in the design process. Therefore, a comprehensive design measurement is needed. If the design knowledge aspects are not achieved throughout the design process, there may be differences in the attempt to achieve a sustainable packaging design. Comprehensive design measurements will therefore be conducted to develop an understanding of the sustainable and packaging design.

3. Research Questions

This study seeks to answer the research question on how values in CVPA measurement interacts with the product aesthetic evaluation of a food packaging design. As a step-up move towards a unified approach in design development, we are expecting some positive values, as this would be the benchmark in achieving sustainable packaging design. From a holistic point of view, general consumers who are sensitive to product design are the ones with a high CVPA. Their sensitivity towards product design and its aesthetic values and might initiate a purchase decision that is persuaded by the physical appearances of the product design (Bunnak, 2009). The interaction of persuasive packaging design on the primary display panel (PDP) dictates its level of aesthetic evaluation.

4. Purpose of the Study

The purpose of the study is to determine the interactive relations of CVPA towards product aesthetic evaluation. In determining this purpose, we quantify the personal values of the selected packaging design. The category of the packaging design is the ready-to-eat meal. This study also complies with other studies showing the moderate effect of CVPA on specific values that led to a positive evaluation of aesthetics, specifically visual aesthetics that influence the consumers' perception in several ways (Bloch et al., 2003; Celhay & Trinquocoste, 2015; Phillips et al., 2014). Olsson et al. (2011) stated that food packaging has always been regarded as an integrated system whereby it is built up of a product with aligned services to the consumers. It does include product safety such as the opening of a can or a bottle, product information that is being displayed on the PDP, and other users' practicability on the packaging. Obviously, with all the designated visual design elements, packaging design is becoming a robust tool in differentiating brands that represent different competing companies, particularly in the food industries. Therefore, this study is to determine the interactive relations of CVPA towards product aesthetic evaluation to determine the interactive relations between the targeted respondents.

5. Research Methods

To test the hypothesis of this study, a questionnaire has been posted online using the Google Scholar forms. The final analysis uses the Structural Equation Modelling (Partial Least square). As for the measurement of variables in this study, the adaptation of CVPA by Bloch et al. (2003) and its values are being applied. The quantitative measures have looked into values that have been adapted within the subject matter of packaging design.

5.1. Target Respondents

The questionnaire was distributed among university students with a design background. Although the university students were not experts within the subject, they were perceived to have a strong comprehension of the fundamentals of elements and principles of arts and design that consist of visual design elements. Celhay and Trinquocoste (2015) and Hekkert et al. (2003) reported that experts in the artistic field had shown higher values on novelty and originality. This statement is paradoxical to those learners who are believed to prefer and more inclined towards better-known designs.

5.2. Data Collection Process

The adapted questionnaire had gone through content validity with a subject matter expert. Computer labs in various design institutions in Malaysia, particularly in the Klang Valley, were chosen to perform the task. The Google Form was addressed to the respondents in a session that was moderated and facilitated by a moderator, comprising of an introduction to the subject matter and the intention of the research study. The respondents were screened by selecting those who passed their fundamentals design subjects (representing individuals with a design background) in each institution involved to ensure data quality.

5.3. Details of the Questionnaire

Table 01. Questionnaire Items

Personal and Social Values of Design	Measuring Scale
Owning products that have superior packaging designs makes me feel good about myself.	Likert Scale 1 (Strongly Disagree) – 10 (Strongly Agree)
I enjoy seeing displays of food products that have superior packaging designs.	
A packaging’s design is a source of pleasure for me.	
Beautiful packaging designs make our world a better to live in.	

The data analysis of this study population involved 450 sets of questionnaires for purposive sampling. The survey form was a close-ended questionnaire with four statements and a Likert-scale scoring from 1 to 10; strongly disagree to agree strongly. Four (4) items are presented in the form of statements, as shown in Table 01. These elements are concerning the respondents’ insights. Therefore, the analysis of the quantitative methods is to determine the interactive relations of CVPA towards product aesthetic evaluation, where the interactive relations seek the CVPA (social values) towards aesthetic views. The survey, which

was set to quantify the subject matter area, i.e. packaging design and its visual elements, was adopted from Bloch et al. (2003) and Bunnak (2009).

5.4. Data Analysis

The elements presented in Table 01 are about the respondents' insights. The analysis of this quantitative method is intended to determine the interactive relationship between CVPA and the aesthetic evaluation of the product. The sampling procedures encompassed the targeted population, i.e. individuals with design sensitivity. In this study, students with design backgrounds were chosen as respondents. Part of the reasonableness of involving design students in this research is due to the the course suitability joined by them. Their classes include design subjects relevant to the research focus, i.e., packaging design for SME food products. Among the defenses of having structure understudies right now the reasonableness of the classes went to by the understudies, whereby the classes depend on the plan subjects identified with the subject under examination; bundling structure for SME nourishment items.

In fact, these students have passed their core course successfully; i.e. introduction to art and design, which consists design principles and components. Correspondingly, Becker et al. (2011) have shown that some useful ideas are often fabricated from design and non-design students. Those thoughts or events are equipped for demonstrating the changing degrees of assessment and evaluations made by the students, which show that design students are capable at giving their opinions with respect to a design's sensitivity. Also, Phillips et al. (2014) positively stated that professionals with more exceptional aesthetic sensitivity exhibited higher concentration on the acceptance of subject changes and creativity in design.

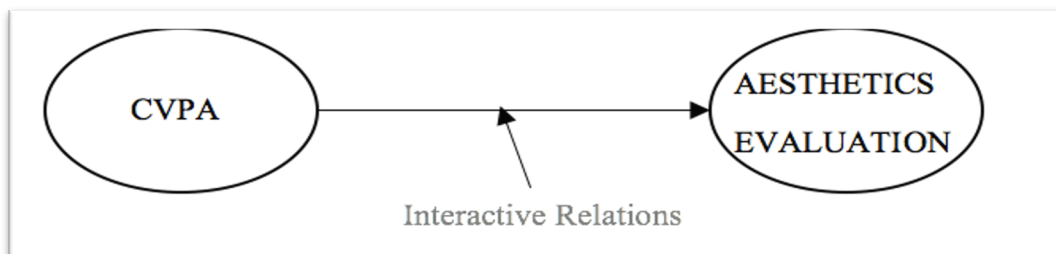


Figure 01. Conceptual Framework

The conceptual framework (see Figure 01) identified the interactive relations between CVPA and aesthetics evaluation, which results in the data analysis. Hence, the aesthetic evaluations that are made by the targeted respondents of certain products reflect the interactive relations between the social values of the individuals' characteristics and their aesthetic perceptions of packaging design, in particular, ready-to-eat meal.

6. Findings

For the analysis, variables were calculated to identify the average scores of the items. The Cronbach's alpha and composite reliability for the latent construct of personal and social values of a design, as depicted by the reliability and AVE evaluations, is beyond the minimum threshold value of .70. Whereas

for the validity (AVE), it should be 0.5 or higher (Wong, 2013). Therefore, the internal consistency in Table 02 shows that the variable is adequate, and this is also evidence of its unidimensionality. Unidimensionality in these findings can be represented by a single number line as latent variable.

Table 02. Reliability and AVE Assessments of the Second Order Measurement Model.

Latent Variable	Cronbach Alpha (α)	Composite Reliability (ρ)	AVE
CVPA	.908	.923	.521

Note: AVE = Average variance extracted.

In general, high CVPA consumers are sensitive to product design and aesthetics in that the appearance of the product may significantly influence their purchase decision. The indicator loading of the second model measurement is presented in Table 03.

The results in Table 03 show that the identified indicators are significantly loaded towards their respective latent construct. The evaluation of the unidimensionality shows that the CVPA Cronbach's Alpha (α) score is .908, which is above the minimum threshold value of .70. Therefore, the entire latent construct, CVPA, is acceptable to an excellent degree of reliability level. It is verified that each distance on both stereotype and ideal products (visual design elements) are moderated by their "aesthetic" expertise, as measured by the CVPA.

The findings of this paper have proven that the CVPA has positive interactive relations on the visual appearance of visual design elements denoting positive evaluation in understanding the importance of packaging design and its aesthetic values. This phenomenon is reliable to be involved in the design process. Therefore, people with design sensitivity have positive value towards product aesthetic evaluation. The assessment demonstrated that the CVPA had a moderate, positive impact on the relationship between PVDE and product aesthetic evaluation (i.e. PVDE \rightarrow EV). Henceforth, when the effect of CVPA is strong, the relationship of the Visual Design and Evaluation is stronger. This is in contrast to the situation when the CVPA is low, thus the strength of the Visual Design and Evaluation relationship is inclined to decrease.

In addition, the indicators in table 03 shows personal and social values of design have the relevancy to design practice. The respondents have interest in packaging design that enjoy seeing displays food products in nice packaging design. These values have contribution to aesthetic perception that indicates experiences particularly in design and packaging itself.

Table 03. Second Model Measurement

Personal and Social Values of Design	Loading
Owning products that have superior packaging designs makes me feel good about myself.	.725
I enjoy seeing displays of food products that have superior packaging designs.	.730
A packaging's design is a source of pleasure for me.	.772
Beautiful packaging designs make our world a better to live in.	.671

7. Conclusion

Our findings offer a clear interpretation of the personal and social values of design, which is the main objective of this paper – generally, a positive personal and social values of design support uniquely

to the aesthetic evaluation. Exploring CVPA is an ongoing concern within the visual style of packaging design in academic, marketing, and industrial research.

While the respondents' perspectives and experiences are depicted via the design's personal and social values, the measurements can be utilised for additional assessment in reinforcing the designers' knowledge and goals in the food packaging design. Thus, designers, food advertisers and producers who are part of this specific procedure, are anticipated to digest the core components that contribute to greater aesthetic qualities. To grasp the United Nation's Sustainable Development Goals, this study's design analysis will centralise on the ninth goal, that is, via the design development, the industry, innovation, and infrastructure are being promoted. Hence, packaging design should be designed and manufactured in a comprehensive and integrated perspective that determines personal and social values in design that will assist the design criteria to the next level.

To explore all possibilities in making sure that sustainability can be achieved, local SMEs, in particular, micro-enterprises, could cater to various areas by understanding that packaging design can enhance and promote their products globally. Limitation of skills to structure in the design process of packaging design can be enhanced with training and information, which enables the industry and businesses to understand the reasons behind the need for change and how to achieve it successfully.

Furthermore, the views and experiences of the respondents in this study, who have a design background, will further help to strengthen the knowledge and design intentions of designers by working together with local food producers in the design of SMEs food packaging. It will also provide an added value to the industry and businesses through engagement with consumers to help them access and interpret food products and to differentiate SMEs' products with other commercial brands. The core element of this study is that the surface design represents a two-dimensional packaging design, which is developed during the design stage. It is also expected that designers, food marketers, and food producers who are involved in this particular process will comprehend the key aspects that initiate higher aesthetic values. However, this paper is limited in several ways. Generally, the measurement could be incorporated for eco-innovation packaging design development efforts because the evaluation corroborates the evaluation of affective attitudes that can be employed by changing the subject matter of exploratory stimulus in the future. It is hoped that the development of measurement may turn to be established standards that promote packaging design regulations that will ensure that design projects and initiatives are sustainably managed.

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