

A Study on Difference of Kansei Imageries Based on the Degree of Involvement

—Using Chocolate Package as An Example

Chen-I Huang*

National Yunlin University of Science and Technology, Graduate Institute of Design,
Ph.D. student*

Shing-Sheng Guan**

National Yunlin University of Science and Technology, Graduate Institute of Design,
Professor**

ABSTRACT

The study probes into the difference of Kansei evaluation between the high and low personal involvement groups. In this case, considering that chocolate is a Kansei commodity that requires imagery and sensitivity; chocolate packaging is taken as the case of this study. The visual design elements of the package are closely linked with the innermost thoughts and feelings of the consumers. In addition to letting the designer know what the consumers think or feel, the result of the study is also expected to be able to promote an affixture value towards chocolate packaging.

The remarkable results of the study are as follow:

1. The package design of the chocolate

Presently, regarding the item of 「title」, 'English' is commonly used. The 'closed-window' category is often used in the item of 'window design'. 'Warm color series' are preferred for the 「color series」, the 'centered text typography', 'square-shaped box' and 'paper-material package' are also commonly used in 「text editing」, 「package style」 and 「package material」 respectively.

2. The relationship between the Kansei imageries and visual design elements of the chocolate package:

Ordinary people taking part in the evaluation indicated that the most concrete connection between the visual design elements and 'contemporary and classical' Kansei words are showed in typography, color quantity and the text's title elements. The visual design elements of packaging style, the language of the title and the ratio of the pictures to letters are showed more important in 'rational and perceptual' Kansei evaluation. The typography, packaging style, and color quantity are showed more important in 'individual or popular' Kansei evaluation.

3. The difference between the Kansei chocolate packaging evaluation groups of high and low personal involvement:

(1) 'Contemporary and classical' Kansei evaluation:

In the 「text design」, the high personal involvement groups thought that 'construction of straight lines' will emphasize positive direction (the classical feeling); consequently negative direction (the contemporary feeling) will be reduced. For the 「window design」, they also had a perception that 'open-window' can increase the positive direction (the classical feeling), while 'closed-window' will increase the negative direction (the contemporary feeling). In the other hand, the low personal involvement groups thought in reverse.

(2) 'Rational or emotional' Kansei evaluation:

They are mostly the same, but there is a difference in the image group, the high personal involvement groups considered that 'pictures' will add more value to the emotional feeling; but 'illustration plus picture' will add more value to negative direction (rational feeling). While, coincidentally, the low personal involvement group's thoughts were contrary to those of the high personal involvement group. Besides, the high personal involvement group had different opinions about the 「color series」, they felt that 'cool color series' are able to give more emotional feeling (positive direction), while the low personal involvement group thought that those 'cool color series' will give more value towards the rational feeling.

(3) 'Individual or popular' Kansei evaluation:

Both have the things in common, but as for the 「packaging style」, the high personal involvement group considered that ‘square-shape boxes’ will increase the sense of popularity (positive direction); ‘bags’ will increase the sense of individuality (negative feeling). While, the low personal involvement group thought in opposite way.

4. The relevance of the high and low personal involvement group to essential elements of the visual design:

In summary; the elements of packaging, typography, and color quantity definitely have a certain influence towards the Kansei evaluation. Hence, if these three items exist, then a certain and obvious influence on the high and low personal involvement groups will appear.

Keywords: Involvement, Design elements, Kansei engineering, Package design

1 INTRODUCTION

As Kansei Era has come, materiality of products gradually becomes less important and more value added—such as spiritual functions which have become the focus of people’s demands. Therefore, when developing and designing the products it is very important to know how people feel and what their preferences are. It can be started from investigating the degree of involvement and cognition towards products so that the designers can design the most satisfactory products.

1.1 Motivation

These recent years, degree of involvement has been the most discussed topic by customer behavior scholars. They assume that degree of involvement does not only interpret persuasive communication with the customers, but is also useful to analyze customer’s purchase behavior.

This research takes chocolate as research sample due to the reason that it is an emotional product. Through gaining understanding on the relationships between design elements in the chocolate package and customer’s feelings, this research is expected to provide concrete and effective advices for designers so that they can build closer and much more emotional feelings in customers’ minds, discover difference of symbol meaning of different involvement target market groups, and enhance the value of chocolate products.

1.2 Purposes

The purposes of this research are as follows:

- 1.To gain understanding on the current trends of chocolate package designs
- 2.To investigate essence of design elements in the Kansei imageries and visual design
- 3.To investigate the differences of Kansei imageries among high and low involvement groups towards chocolate product packages
- 4.To analyze and summarize visual design elements from groups with high and low involvement which can be used as reference in the future

1.3 Research Scope and Limitation

The scopes of this research are as follows:

- 1.As the chocolate market is extremely abundant, this research collects chocolate-based products from different markets and focuses on products that people call “chocolate.” While others products that are using chocolate as materials will not be included in this research.
- 2.In order to gain objective research, therefore this study limits the samples into chocolates that are marketed through open shelf channels.
- 3.As same brand has similar designs and different tastes, therefore this study takes chocolate with its original taste as representative samples.
- 4.In the aim of obtaining much more reliable results, the emotional symbol of the chocolate package design is focused on real chocolate products as samples.

1.4 Research Procedure

The procedure of this research is as described in figure 1-1:

2 LITETATURE REVIEW

This chapter mainly investigates on the following issues: definition and application of involvement, studies related to involvement, meaning of Kansei, Kansei Engineering and its application, and some research analysis theory such as morphological analysis, cluster analysis, factor analysis and other related studies.

3 METHODOLOGY

This study investigates on the differences of Kansei imageries of high and low involvement groups, and takes chocolate products as subject. The procedures of this research are as follows:

- (1) Firstly, use focused group method to classify visual design elements of chocolate package designs and also apply hierarchical cluster analysis method in order to select the lexicons for research samples.

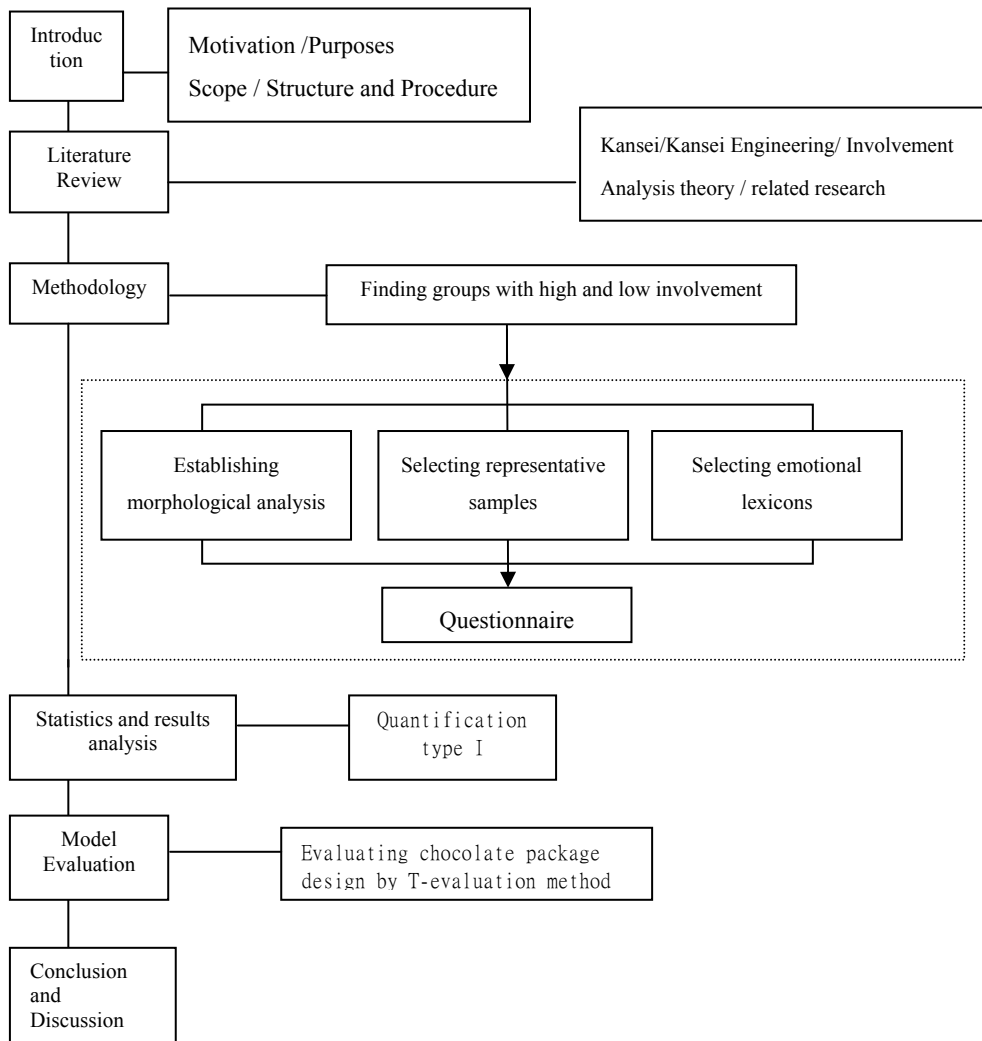


Figure 1-1 Research flowchart

(2) Through review of literature, some lexicons were collected and selected by applying Delphi method. These lexicons were tested on 30 subjects and the representative lexicons were selected. An investigation on the table scale of the collected and selected lexicons was conducted in order to find out Kansei lexicons.

(3) A scale table was made based on representative chocolate samples and final Kansei lexicons. Then, the research was conducted on both high and low involvement groups (among 300 subjects, the highest and lowest scores were each achieved by 25 subjects. The results were analyzed by quantification type I analysis in order to obtain the importance of visual design elements and their influences towards the emotion.

(4) Lastly, visual design elements that influence emotional levels were analyzed and combined to summarize a standard model and apply it on current market in order to discover sample that

could meet the emotional demand. Then, subject evaluation and verification was conducted. By applying T-evaluation method, the quantification type-I analysis model was applied to compare the scores and the subject evaluation as visual measurement in order to obtain much more precise and subjective results.

4 RESULTS ANALYSIS AND DISCUSSIONS

4.1 Statistics of lexicon grading and encoding of visual design elements

The chocolate package sample and Kansei lexicons were made into questionnaire and based on SD method and seven measurements in order to conduct evaluation. Fifty subjects (25 from high involvement group, and 25 from the low involvement group) were given 30 chocolate samples to conduct lexicon grading.

Before conducting quantification type-I, categories of visual elements of chocolate package were encoded into numbers as shown in table 4-1. After the encoding, 30 chocolate samples and three final classifications were summarized into matrix table in order to conduct quantification type-I.

Table 4-1 The category list of visual design elements

Item	Category
A. Language of the header	(1) English (2) Japanese (3) Mixed (e.g.: Mandarin + English)
B. Header font	(1) Straight structure (2) Curve structure
C. Window Design	(1) With window (2) No window
D. Image type	(1) Illustration (2) Photos (3) Illustrations + Photos
E. Amount of colors (richness)	(1) Less than four colors (2) Four to seven colors (3) Above seven colors
F. Color (impression)	(1) Warm colors (2) Cold colors (3) Neutral colors
G. Typography	(1) Align left (2) Align Center (3) Justify
H. Ratio between texts and graphics	(1) Text-dominant (2) Graphic-dominant (3) Equal proportion between text and graphics
I. Package	(1) Papers (2) Bag (3) Box (4) Special design
J. Package material	(1) Papers (2) Plastics

4.2 Result Analyses

Results analyses of all subjects towards the contemporary/classic lexicons are as follows: thirty research samples regarding to contemporary/classic lexicons and visual design elements were processed based on the quantification method type I as shown in table 4-2.

Table 4-3 shows lexicons that scored the highest (positivity→ classic) and the lowest (negativity→ contemporary) results of influence towards the visual design elements. The following categories showing positive results are as follows: less than 4 colors, neutral color, package design, etc.; while contemporary feeling contributing negativity is shown by the following categories: header language—English, typography—justify, text-dominant, etc. Therefore, the chocolate design package with classic feeling can be achieved through adding the positive categories, while contemporary feeling can be achieved through adding negative categories such as applying mixed language, justified typography, special designs, etc.

Table 4-2 Result analysis of contemporary/classic lexicons by quantification type-I method

Item	Category	Results Contemporary← →Classic	Partial Correlation Bias
Header language	English	0.115	0.426
	Japanese	-0.158	
	Mixed language	-0.279	
Header font design	Straight	0.007	0.018
	Curved	-0.006	
Window design	With window	-0.015	0.021
	Without window	0.005	
Graphic types	Illustration	-0.148	0.234
	Photos	0.040	
	Illustrations + photos	0.052	
Colors	Less than four colors	0.357	0.561
	4-7 colors	-0.191	
	More than 7 colors	-0.263	

Table 4-4 shows the residual values between observative and predictive values for the contemporary/classic lexicons. In this research, the results showed that there were 24 samples with total residual value of 0.5 (not including positive or negative coding) representing observative and predictive values are extremely close.

Three samples with the highest observative and predictive values were shown by sample 4 with 0.57894, sample 55 with -0.5296 and sample 73 with -0.5271 as described in table 4-5.

These three aforementioned samples were analyzed and summarized as follows: sample 4 has 4 positive and 6 negative categories with predictive value of 3.08016, observative value of 3.66, residual value of 0.57894, mixed language, curved font design, 4-7 colours, warm colors, justified typography, plastic material which shows negative/contemporary feeling. As for amount of colors used, applying 4-7 colors would result in uneven distribution. If single color (light skin color) is applied as main focus and other colors as decorations, it will create better stability and add elegance, dignity, and classic feelings into the package design (Zhu, 2001)

Table 4-3 Analysis of contemporary/classic lexicons with highest results

Category	Header language	Font design	Window design	Graphic types	Amount of colors	Color	Typography	Graphic and text ratio	Package Design	Package material
Positive additional value	English 0.115	*Straight 0.007	Without window 0.005	Illustration + photos 0.052	*Less than 4 colors 0.357	*Neutral colors 0.332	Align center 0.163	Equal 0.177	*Bag 0.493	Papers 0.055
Positive/negative additional value	*Mixed language -0.279	Curved -0.006	*With window -0.015	*Illustration -0.148	More than 7 colors -0.263	Warm colors -0.190	*Justify -0.512	*Text-dominant -0.237	Special design -0.357	*Plastics -0.128




Notes: Bold and asterisk (*) represents category with highest level

Table 4-4 The residual values of observation and predictive values of all 30 subjects towards contemporary/classic lexicons

Sample	Observation	Predictive value	Residual value	Sample	Observation	Predictive value	Residual value
▲4	3.66	3.08106	0.57894	36	3.48	3.40571	0.07429
7	3.62	3.7144	-0.0944	38	4.34	3.87832	0.46168
12	3.8	3.73449	0.06551	47	3.6	3.68031	-0.0803
13	3.64	4.14708	-0.5071	48	2.86	3.30028	-0.4403
15	3.98	3.47624	0.50376	▲55	3.5	4.0296	-0.5296
17	2.82	2.98959	-0.1696	60	3.12	3.39964	-0.2796
20	2.8	2.49147	0.30853	64	3.08	3.22508	-0.1451
21	4.44	4.30504	0.13496	65	3.1	3.15585	-0.0558
23	3.44	3.52283	-0.0828	67	3.9	3.75532	0.14468
24	3.86	3.49385	0.36615	△68	2.72	2.76337	-0.0434
△26	3.54	3.5614	-0.0214	71	2.96	2.94552	0.01448
27	3.76	3.53257	0.22743	▲73	2.7	3.22713	-0.5271
28	3.92	4.26469	-0.3447	78	3.64	3.7671	-0.1271
△33	3.66	3.66773	-0.0077	84	2.54	2.82516	-0.2852
34	4.82	4.3149	0.5051	85	4.26	3.90428	0.35572

▲Three samples with highest residuals △Three samples with lowest residuals

Table 4-5 Samples with highest residual values of observation and predictive values of contemporary/classic lexicons (for all subjects)

Number	4	55	73
Sample			
Observation	3.66	3.5	2.7
Predictive Value	3.08106	4.0296	3.22713
Residual value	0.57894	-0.5296	-0.5271
Header language	Mixed (negative)	Japanese (negative)	English (positive)
Font design	Curved (negative)	Curved (negative)	Curved (negative)
Window design	Without window (positive)	Without window (positive)	Without window (positive)
Graphic type	Photos (positive)	Photos (positive)	Photos (positive)
Amount of colors	4-7 colors (negative)	Less than 4 colors (positive)	4-7 colors (negative)
Colors	Warm colors (negative)	Warm colors (negative)	Warm colors (negative)
Typography	Justify (negative)	Align center (positive)	Align center (positive)
Graphic and text ratio	Equal (positive)	Equal (positive)	Graphic-dominant (negative)
Package design	Bag (positive)	Box (negative)	Special design (negative)
Package material	Plastics (negative)	Papers (positive)	Papers (positive)

Sample 55 has 6 positive and 4 negative categories with predictive value of 4.0296, observative value of 3.5, residual value of -0.5296, package design with 6 positive categories (without window, photos, less than 4 colors, align center, same ratio between text and graphic, and with paper material) which can increase the classic feeling. Furthermore, the photos apply computer technique to compose a mosaic emphasizing characteristics of delicacy, hence increasing the contemporary feeling.

Sample 73 has 5 positive and 5 negative categories, predictive value of 3.22713, observative value of 2.7, and residual value of -0.5271, while the morphological design element analysis tended to be in the golden mean condition. Furthermore, this sample applied 5 negative categories (curved font design, 4-7 colors, warm colors, graphic-dominant, special package design) as it would provide stronger emphasis, therefore factors that increase contemporary feelings are as follows: unique package design, photo editings, and so on.

5 MODEL EVALUATION

The evaluation model of this research is mainly aimed at understanding the best combinations of visual design elements for chocolate packages whether it will suit the feeling of high and low involvement groups. Therefore, this stage selected the suitable Kansei imageries for the chocolate package designs based on the high and low involvement groups.

While selecting the evaluation model, the sample 1 possessed contemporary Kansei imagery, sample 2 with classic Kansei imagery, sample 3 is between the contemporary and classic feeling, sample 4 with rationality, sample 5 with emotion, sample 6 is between rational and emotional feeling. On the other hand, sample 7 contains customization, sample 8 with generalized emotion, and sample 9 is between customized and generalized imagery.

Nine samples were shown to fifty subjects (including both high, low involvement groups) and they were required to conduct evaluation on the related lexicons and select the most representative lexicons, and then T-evaluation method was conducted to compare the results from the previous evaluations. If the patency is lower than 0.05, it means that results of the evaluation and questionnaires on the emotional measurement show significant differences, while the predicted results and the subjects in reality had different feelings. Contrarily, if the patency is higher than 0.05, then it means that the predicted results and the feeling received by the

subjects are quite similar, therefore this evaluation model possesses higher reliability.

During evaluating sample 1, 2, 3, 5, 8, 9, the patency (P-value) of the model evaluation was set higher than 0.05, which represented that these 6 samples did not show significance differences of the results in feeling measurement and quantification type-I. Consequently, it can be concluded that the morphological analysis of these six samples suit the quantification type-I analysis model. Therefore, the package design of the chocolate could apply contemporary and classic feelings through the golden mean of contemporary/classic feeling, rationale and generalization, or customized/generalized golden mean, and other Kansei characteristics. These aforementioned categories can be a reference for designing chocolate package.

On the other hand, when evaluating sample 4, 6, and 7, there was a phenomenon showing that there was a category with less than 0.05, which meant that three samples were tested on the subjects for evaluating the visual elements, it showed that there was a significant difference between the results of feeling measurement and quantification type-I.

6 CONCLUSION AND SUGGESTIONS

The results of this research can be classified into four parts: current trends in chocolate package designs; relationship between Kansei imageries and visual design elements; emotional differences of high and low involvement groups towards chocolate product packages; the similarities of visual design elements in groups with high and low degree of involvement.

6.1.1 Current trends in chocolate package design

For the chocolate package design, English is the most common language for the headers. Furthermore, mostly it has no windows and generally uses warm colors.

6.1.2 Relationships between Kansei imageries and visual design elements

The relationships between Kansei imageries and visual design elements of chocolate package design are as follows: general subjects showed that typography, amount of colors, and header language are crucial visual design elements for generating contemporary/classic lexicons. While rational/emotional lexicons were emphasized on the following categories: package design, header language, ratio between graphics and text. For customized/generalized lexicons were emphasized

by the following visual design elements: typography, package design and amount of colors.

6.1.3 Emotional differences of high and low involvement groups towards chocolate product packages

- (1) Contemporary/classic feeling: for the font design, high involvement group assumed that straight structure and adding window design could add positivity and classic feeling, while curved structures and no-window designs would add negativity and contemporary feeling. On the other hand, the low involvement group possessed opposite viewpoints.
- (2) Rational/emotional feeling: Overall, the results are quite similar, but for the graphic types, high involvement group thought that photos can increase the positivity (emotional feeling), while illustration + photos can increase the negativity (rational feeling). On the other hand, low involvement group thought in the opposite ways. For the feeling towards colors, high involvement group thought that cold colors could increase the positivity (emotional feeling), while the low involvement group thought that cold colors would increase the negativity (rational feeling).
- (3) Feeling towards customization/generalization: Overall, the results are quite similar, but for package design, high involvement group felt that box would increase the positive feeling (generalization) and bag would increase the negative feeling (customization); while the low involvement group thought in opposite ways.

6.1.4 Similarities of visual design elements in groups with high and low degree of involvement

Overall, it can be concluded that the package design, typography, amount of colors, and other visual design elements towards Kansei imagery evaluation are much more influential. When these categories were expressed in the design, the high and low involvement groups showed significant influence.

6.2 Further Research and Suggestions

As for the uncovered and limited scopes, suggestions and further research directions are as follows:

This research is based on involvement as standard for evaluating customers' feelings towards the products. Furthermore, it is also suggested that package designers can pay attention to different customers based on the

essence of visual design elements; as market segmentation has different facets, therefore it is suggested that other variables can be added into the future researches, such as cognitive value, education background, etc.—which can achieve deeper and different layers of understanding towards target customers' emotional needs.

The morphological elements table of this research is classified by senior and professional package designers with at least five-year experience, but they possessed quite different analysis viewpoints towards font design, color richness, etc., therefore it is suggested that researchers who are interested in this topic can conduct questionnaire analysis for gaining understanding of customers' cognition in much more detailed categories and broad contexts so that the research results can be much more precise and reliable.

7 REFERENCES

1. Ball, G and D. Hall, 1963, *Background Information on Clustering Techniques* (Menlo Park, CA: Stanford Research Institute)
2. Cross N., 1994, *Engineering Design Methods*, John Willy & Sons Inc., New York.
3. Eversheim, W., Roggatz, A., Zimmerman, H-J; Derichs, T., 1997, *Information Management for Concurrent Engineering*, *European Journal of Operational Research*, Vol. 100, ISSN: 2 Order: LIB, pp. 253-265.
4. Flynn, L.R., and R. E. Goldsmith, 1993. *Application of the Personal Involvement Inventory in Marketing*, *Psychology and Marketing*, 10(4), pp. 357-366.
5. Krugman, H.E., 1965, *The Impact of Television Advertising Learning Without Involvement?* *Public Opinion Quarterly* vol: 29, pp. 349-356
6. Mittal, M., 1989, "Measuring Purchase-Decision Involvement", *Psychology and Marketing*, 6(2), pp. 147-162.
7. Rummel, 1970, "Applied Factor Analysis", Evanston, III Northwestern University Press.
8. Roberston, T S. & Kassarian, H.H. (Eds.), 1984, *Handbook of Consumer Research*, pp. 50-84, N.J.: Prentice Hall.
9. Tuttle, B.L., 1991, *Design for Function: A Cornerstone for DFMA*, *International Forum on Product Design for Manufacture and Assembly*, Newport, RI.