

The Comprehension Modes of Visual Elements: How People Know About the Contents by Product Packaging

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Abstract

When shoppers enter a retail store, how do they comprehend the products in front of them? What visual elements can communicate messages in an effective way that help people comprehend product contents? Design and marketing personnel should pay attention to these issues. This study aims to investigate how people perceive and comprehend a product. It is conducted in three phases: Phase One involves collecting food package samples with “Stratified Sampling”; Phase Two consists of conducting focus group interviews to seek the participants’ opinions. Phase Three includes a summary and analysis of the interview result. There are seven modes of comprehension obtained from the opinions of focus group members. The research results summarized below can be used as reference for design and marketing personnel in developing new product packages in the future: (a) Focus group members mostly comprehend the messages of packaging via more than two visual elements. (b) “Typography + illustration” is the best mode for group members to comprehend products. (c) Design elements such as brand name, product name, product image, package shape, and color association all contributed to the comprehension of products; while attached product information design, structure design, and volume design did not make such contribution.

Keywords: Product Packaging, Visual Element, Comprehension.

1. INTRODUCTION

“Packaging” plays the important role of a “silent salesman”. It is a self-promotion tool of marketing that attracts consumers’ attention [1], and has proven to be stimulating sales volume. Even if a product has not gone through any advertising, yet its sales volume and market share continue to grow, both because of its packaging [2]. Design and marketing personnel should not only optimize the findability of packaging, but also consider how to display it on the shelf [3].

A good package can properly communicate a product for better comprehension. Design and marketing personnel expose product contents through such visual elements as word, graphics, color, trade mark, shape, size, and texture [4], so that people can more easily find and comprehend them. Some studies indicates that “comprehensibility” is the basic condition of design [5].

“Packaging” is the most immediate stimulus for shoppers. People are usually selective to varied visual elements. They have different degrees of attention, and ways of comprehending and storing information. Every individual has different comprehension and interpretation even if they are looking at an identical product. Design and marketing personnel expose the products with a combination of visual elements, while people try to identify it according to their personal experience and habits [6]. The visual elements of packaging design influence consumers’ decision and choice as it has become an advantage in competition. Packaging can attract consumers’ attention, transform the message of the product, impress consumers with the image of the product, and distinguish one product from another [7].

This study aims to find out how people comprehend product packaging, and focuses on the comprehension modes of visual elements. The purposes of this study are as follows:

- (a) To understand by means of focus group interview how people comprehend the visual messages communicated by product packaging.
- (b) To make summary and analysis of what visual elements are easier for the focus group to interpret and comprehend.
- (c) To find out the advantageous design factors that prompt the focus group to interpret and comprehend the visual elements.

2. LITERATURE REVIEW

2.1 Visual Elements of Packaging

Packaging is the communication interface between the producer and the consumer, and it is composed of two parts: shape and structure design (structure and shape) and exterior graphic design (color, typography, and decoration) [8]. According to the differentiation in design elements, they can be divided into visual and functional [6, 9], as shown in Table 1 and Figure 1:

- (a) Aesthetic design element: Shape (form), color, illustration (lines, symbols, graphics, patterns, and pictures), logo and brand, typography (company name, product name), pattern design (lines, patterns, illustrations, photos), brand name and address, product facts and usage instructions, ingredients, volume (or weight) and decoration to form a layout (Figure 2).
- (b) Functional design element: Structure design (protection, storage, transportation, opening and resealing functions), material design (emotional appeal and window presence value), and volume design (economic function).

Visually aesthetic design element		Functional design element	
·Shape	(a) Shape design	·Material	(f) Auxiliary packaging material design
·Typography	(b) Brand name design	·Texture	(g) Texture design
·Illustration (including graphics, patterns, and illustrations)	(c) Pattern design (including lines, patterns, illustrations, photos, etc.)	·Structure	(h) Structure design
·Color	(d) Color design	·Volume	(i) Volume design

(e) Attached product information design

TABLE 1: Visual Elements of Package Design

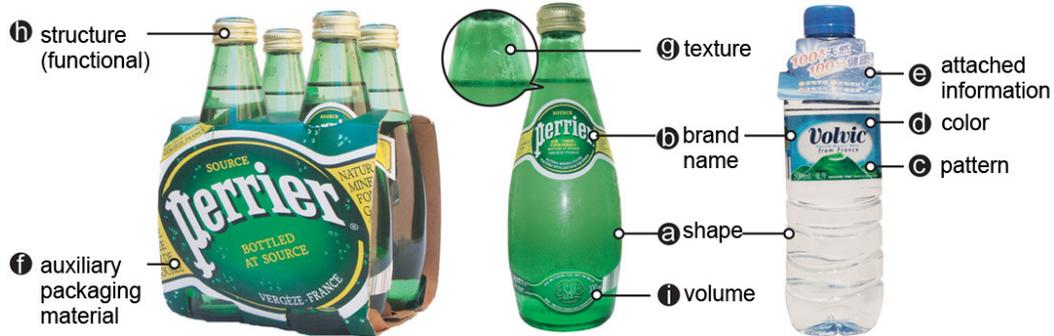


FIGURE 1: Visual Element in Product Packaging Design

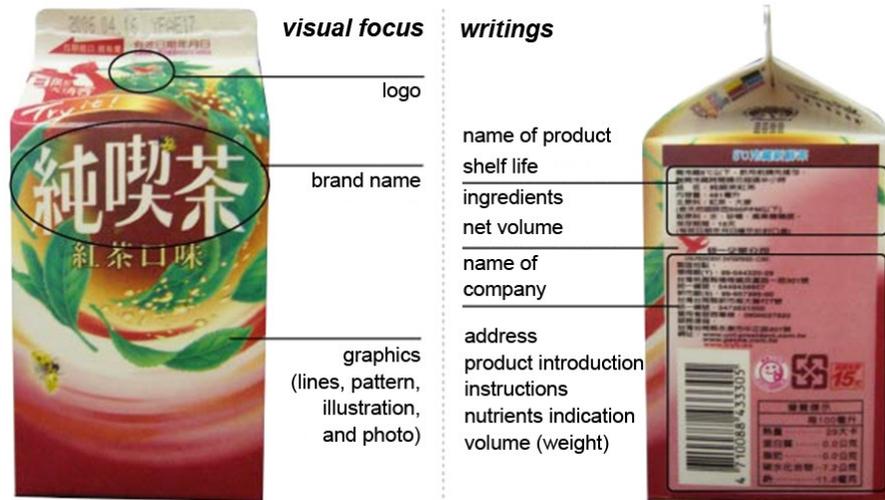


FIGURE 2: Focus of Visual Design in Packaging

2.2 Consumer’s Perceptual Process

Most consumers make a visual search and interpret a product through some perceivable messages. Easily understandable package design is preferred by them. In general, consumers will actively search for the information beneficial for their interpretation of the product. They have their own preference for the types of information and way of exposure on the package—some focus on the price, some emphasize product appearance, and some care about after-service, guarantee, and useful information [10, 11].

Brand identity and package design are connected with personal experience [12]. Design and marketing personnel have their own preference for package design [13]. They create differentiation in packaging with the visual elements mentioned above to attract consumers [14]. Hence, Design and marketing personnel should take advantage of some easily-understandable visual elements to attract prospective customers when designing the packaging.

Consumer’s Perceptual Process can be divided into three stages: exposure, attention, and comprehension. Design and marketing personnel expose the product using visual elements that

attract consumers' attention. The visual stimuli created by these elements help consumers comprehend the product contents. Once consumers notice the stimulative information on the package, they can start to interpret it by organizing, comparing, and inferring it, and then comprehend the product [15, 16].

2.3 Information Processing

Psychologically speaking, the uniqueness and scenario of package design will affect consumers' acceptance of a product, so a response model of consumers to products was proposed [17]. Product design stimulates consumers' attention, and they interpret the information created by the visual elements on the package to comprehend the product. The interpretation includes three steps: organization, comparison, and inference. Only through the three steps will the interpretation be completed [15].

After product packaging (a) is exposed (b) and noticed (c), consumers organize and categorize some specific visual elements or their combination. Next, they infer the features of some stimuli according to their own subjective experience, and produce meaningful information stimuli (d). Furthermore, memory will affect our information and the way we interpret it; meanwhile the information we have received will create memory (e) [11]. After consumers accept messages and keep them as impressions, they can be used to interpret information or for purchase and consumption decision-making (f) [16]. The procedure of information processing when consumers perceive product packaging is used as the theoretical basis of comprehension modes of visual elements in future studies (Figure 3-4).

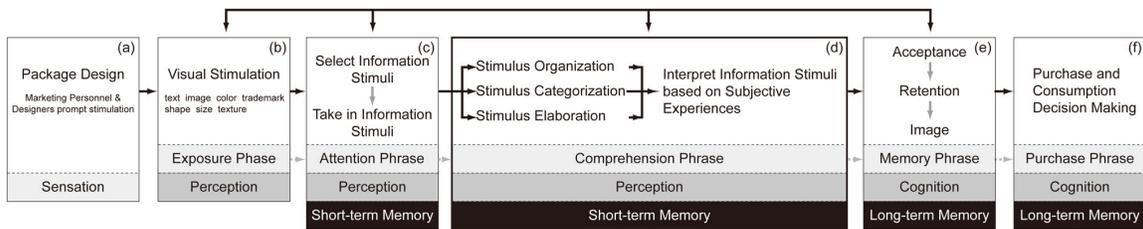


FIGURE 3: The procedure of information processing for consumers perceiving product packaging (Drawn as per literature)

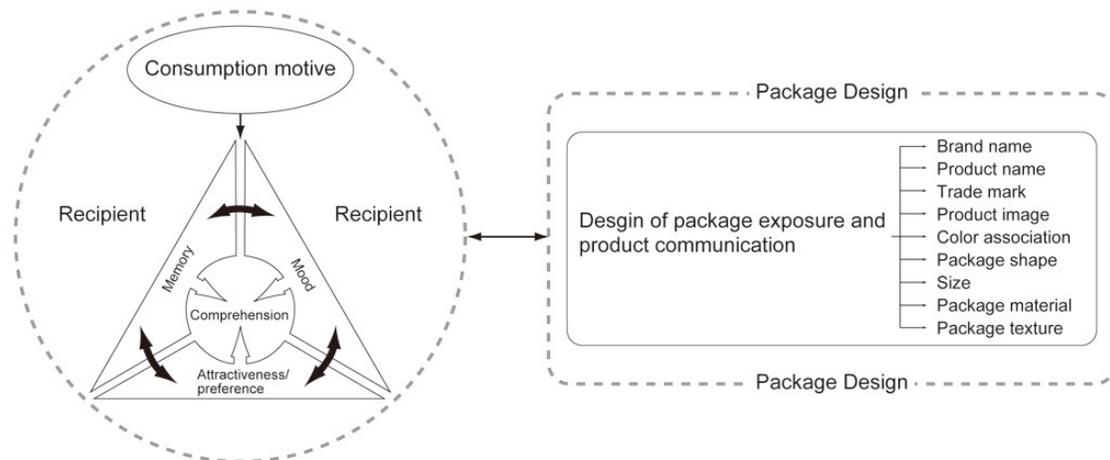


FIGURE 4: Cognition model for comprehension of product packaging

2.4 Differentiation in Package Design

Package design is the “salesman on the shelf” [18, 19], which requires logo typography to stand out to be easily found and identified, and to be included in the list of commodities consumers

want to buy [20]. Most busy shoppers will not stop to look carefully at a certain product. The best way to determine the quality of package design is understanding of product information, which will help consumers learn about the brand name and brand properties, and thus form a brand association. This is also helpful in building brand identity and image [21]. Thus, we can well understand why visual design of packaging is so important.

Effective package design will help consumers easily find their desired products or tell the difference by visual search [22, 23]. For example, highlighting brand or packaging features (distinctive color, unique figure, individualized font, convenient structure) for communication of design messages will improve package findability as well as draw short-term attention and boost sales [24]. Colors, figures, volume, texture, material and typesetting are all design elements used to build brand images and personality [4]. Package design expresses distinguishing features of a product in a visual manner, and help specific group of consumers conduct expected behavior of purchase [25].

Product packaging is truly an important factor in affecting buying decisions [26]. In this study, we assumed that design elements will vary with beverage packaging, including shape, brand name, pattern, color, and attached product information [27]. Some other studies indicate that containers like cans and bottles are representative of packaging containers [28]; we can recognize the difference between brands by the color of the packaging; typography is one of the most important factors of package design in differentiating the brand and making a buying decision [29, 30]. Most of the studies on package design have focused on definite and controllable variables without conducting complete investigation. Hence, their research results are limited to some aspects. Therefore, knowledge on the correlation between the differences in design elements and findability resulting from past studies on trade dress is fragmented and incomplete. Through a literature review, this study attempts to explore how the participants perceive and tell the difference in product packaging, and is further investigating what forms of visual elements consumers prefer and can use to find the packaging.

3. RESEARCH METHOD

For any new product packaging, focus groups are usually used to both gather information on consumer demand and maintain objectivity in identifying the good and the bad in package design elements [31, 32]. This research takes food package design as an example to explore comprehension modes of visual elements for package design through focus group interviews. This research is conducted in three phases: Phase One involves collecting food package samples; Phase Two consists of conducting focus group interviews. Phase Three includes a summary and analysis of the interview result.

3.1 Collecting Food Package Samples

Samples were collected from foodstuffs sold in RT-MART, a retail chain store in Taiwan owned by the 5th biggest retailer in Europe---Auchan Trading Co. Due to the fact that retail stores sell vast number of foodstuffs, this research adopted a stratified sampling method of collecting the actual samples by identify 90 samples from a pool of 2,867 products in the "Top Eighty Percent Best Selling Normal Products Chart". The steps were: (a) Samples were divided into 30 product categories and the sub-category with most items was selected from each category as the sampling representative for that particular category (see Table 1). (b) From the sampling representatives, then, the top 3 best sellers were selected as the actual samples of this research, totaling 90 food packages.

Each sampling representative group is selected from 30 commodity classifications		The top three sales articles are selected from each group
Category	Sub-categories [Number of Item] Sampling Representative	
01 Refrigerated Foodstuffs	Vegetarian food [22] Bean Products [16] Refrigerated Seasoning [13] Rice Products [9]	

	Vegetable Products [5]	
	Wheat Products [25]	
02 Fresh Juice	Tea & Coffee [18] Soy/Rice & Peanut Milk [12] Jelly [8] Pudding [6] Fresh Juice [36]	
03 Milk	UHT Milk [13] Fresh Milk [22]	
04 Yoghurt	Yoghurt Jelly [18] lactic acid drinks [9] Fermented Milk [21]	
05 Cheese & Dairy Products	Blocked Cheese [12] Normal Butter/Paste [12] Processed Cheese [7] Others [5] Fresh Cream [4] Sliced Cheese [16]	
06 Egg	Egg [3] Processed Egg [10]	
07 Processed Meat Products	Ham/Bacon [10] Gift Box [1] Sausage & hot dog [15]	
08 Frozen Foodstuff	Meat Bun, Steamed bun [29] Snack [22] Pots [20] Processed Meat [19] Dumpling [16] pastry [15] Wheat Products [14] Vegetarian Food [14] Meat Ball [14] Processed Seafood [14] Flavor Pak [13] Sticky Rice Ball [10] Pot [29]	
09 Ice	Ice Stick [9] Ice Snack [8] Other Ice Products [5] Gift Box [3] Ice Cream [29]	
10 Tea & Coffee	Milk Tea [12] Flavored Tea [12] Coffee [9] Oolong Tea [8] Jasmine Tea [8] Black Tea [6] Lemon Tea [5] Tea [5] Green Tea [15]	
11 Juice	Fruit & Vegetable Juice [12] Pure Juice [7] Juice [31]	
12 Longer Lasting Products	Soy Milk [12] lactic acid drinks [8] UHT Milk [7] Instant Sweets [5] Gift Box [2] Nutritional Milk Products [1] Flavored UHT Milk [17]	
13 Beverage	Mineral Water [20] Vinegar drinks [12] Sports Drinks [9] Cola [8] Functional Drinks [8] Soda [25]	
14 Candy	Candy [42] Chewy Candy [26] Chewing Gum [19] Gift Box [7] Counter [1] Chocolate [72]	
15 Cookie	Corn & Potato Snacks [80] Waffle [73] Rice Cookies [21] Gift Box [5] Multigrain Cookie [94]	

16 Oriental Snacks	Jelly [26] Bean Curd [21] Preserved Fruits [20] Nuts [20] Western Nuts [16] Meat [14] Gift Box [4] Fish [28]	
17 Wheat Products	Noodles [42] Flavor Pak [22] Instant Soup [16] Rice Noodles or Green Bean Noodles [14] Instant Rice Noodles or Green Bean Noodles [3] Instant Congee [3] Instant Noodles [96]	
18 Alcohol	Whisky [44] Sweet Wine/Base Wine [32] White Wine [29] Gift Box [24] Brandy [14] Chinese White Wine [11] Beer [9] Sake [6] Medicated wine [3] Red Wine [69]	
19 Soy Sauce Seasoning	Chili Sauce [25] Seasoning [20] Noodle Sauce [17] Mayonnaise [11] Tomato Sauce [3] Soy Sauce[44]	
20 Flavor Seasoning	Monosodium Glutamate [18] Sugar[16] Vinegar [12] Honey [11] Sesame Oil [10] Fructose [5] Salt [4] Seasoning [55]	
21 Oil	Olive Oil [7] Sunflower Oil [5] Grape Seed Oil [5] Salad Oil [4] Vegetable Oil [3] Peanut Oil [3] Animal Oil [1] Others [1] Oil [17]	
22 Canned Foodstuff	Pickles [25] Fruits [13] Soup [12] Others [12] Gluten [11] Vegetable [11] Meat [8] Dried Meat Flakes [10] Fish[41]	
23 Rice	Others [22] Flour [6] Rice [29]	
24 Milk Powder for Adults	Non-/No Fat Milk Powder [8] Whole Milk Powder [7] Functional Milk Powder [25]	
25 Baby Food	Baby Flour [13] Follow-Up Milk Powder [10] Baby Milk Powder [9] Infant Milk Powder [8] Nutritional Supplements [6] Baby Foodstuff [14]	
26 Flour	Rolled Oats [22] Paste [27]	
27 Tea Leaf	Canned Tea [42] Bagged Tea [51]	
28 Nutritional Foodstuff	Chicken Essence [19] Vitamins [11] Four Herbs Drinks [9] Biochemical [1] Healthcare [33]	
29 Coffee	Coffee Beans [15] Instant Coffee [12] Cream [8] 3-in-1 Coffee [36]	
30	Instant Drinks[10] Gift Box [9]	

Other Flavored Foodstuff **Multigrain Powdered Drink [44]**

Source: Products in **Bold** are sample representatives.

TABLE 2: Summary of Food Package Samples

3.2 Conducting Focus Group Interview

This research adopts the “focus group interview” method to gather personal experiences and perception of group members on the types of comprehension for product packaging. Focus group members discussed among themselves on what types of visual elements would influence their comprehension. Through categorizing and analyzing research data, the relationship between product package design and consumers’ comprehension was thus identified.

3.2.1 Selection of Focus Group Members

The focus group members were selected based on their shopping frequency (those who shop at retail stores at least once a week were chosen). Six members aged 20-25 volunteered to participate in the focus group. Before the focus group interview was conducted, ensure that group members are able to distinguish among different types of products, and indicate the visual elements that help them know about the contents.

3.2.2 Implementation of Focus Group Interview

The interview with the focus group was conducted in a closed, quiet meeting room to keep free from interruptions. During the interview, the package samples were shown in real size, with their fronts facing forward as goods are commonly displayed in a store. Fluorescent lamps were used in the room, where the lighting level was set at 350lx, bright enough for participants to clearly see the samples on the screen. In this paper, the researcher served as the moderator, and guided the members of focus group to discuss the comprehension modes that help them know about the contents. The interview lasted nearly 120 minutes, and in order to prevent fatigue, caused by long hours, from affecting the quality of the interview, we took a 5-minute break every 30 minutes. The outlines and procedure of interview with the focus group are shown in Figure 5 and Table 3.

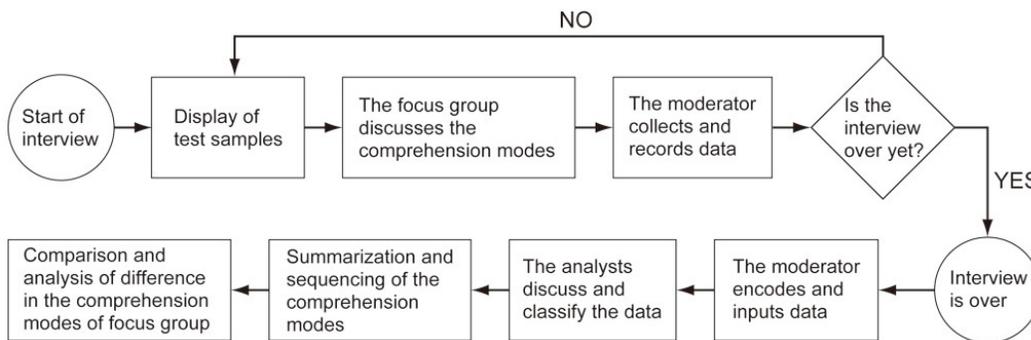


FIGURE 5: Procedure of the Focus Group Interview

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- (i) What visual elements will affect your comprehension of packaging when you see a food package? (If the group fails to engage in a discussion, ask about the importance of each of the following elements):
 - (a) shape design (b) brand name design (c) pattern design (d) color design
 - (e) attached product information design (f) auxiliary packaging material design
 - (g) texture design (h) structure design (i) volume design
 - (ii) Let’s discuss with pictures about how you comprehend package contents? (Focus group members had a discussion to summarize the comprehension modes of visual elements.)
 - (iii) Do you need to add any other personal comprehension experience?
-

TABLE 3: Interview Outlines on Comprehension Modes of Visual Elements

3.2.3 Interview Data Analysis

The proceedings of this interview had been documented by the researcher. After the focus group interview, the group members' comprehension modes were coded and entered into the computer. Two data analysts then proceeded with the categorization of data, who then discussed after they had each finished their own categorization to make sure of the categories.

4. RESEARCH RESULTS AND ANALYSIS

Focus group started their discussion from factors that affect their comprehension of packaging contents. In the event that group members did not voluntarily share other design element factors, the moderator had to name a few elements accordingly and prompted for discussion, so as to provide a more complete selection of choices for the group members on the subject of comprehension modes of visual elements. Group members all had a chance to voluntarily discuss the most important factor for them in comprehending products. Focus group members provided their personal cognition of the 90 food package samples. As to what visual elements will achieve viewer comprehension, the answer varies from category to category. The research results and analysis are based on the majority of opinions gathered from the focus group interview. There are seven modes of comprehension obtained from the food package samples, as categorized in Table 4.

No.	Comprehension Mode	Visual elements (design elements)	Number of samples/90 (proportion)	Representatives
1	Typography + Illustration	(a) Brand Name + Product Image	15/90(17%)	
		(b) Product Name + Actual Product Appearance	13/90(14%)	
		(c) Brand Name + Actual Product Appearance	11/90(12%)	
		(d) Product Name + Product Image	10/90(11%)	
		(e) Brand Name + Product Name + Product Image	8/90(9%)	
2	Typography	(f) Renowned Brand	6/90(7%)	
3	Typography + Product Shape	(g) Package Shape + Brand Name	6/90(7%)	
		(h) Product Name + Package Shape	2/90(2%)	
4	Product Shape + Illustration	(i) Package Shape + Actual Product Appearance	6/90(7%)	
		(j) Package Shape + Product Image	2/90(2%)	
5	Illustration	(k) Actual Product Appearance	5/90(6%)	
6	Product Shape + Color	(l) Package Shape + Color Association	3/90(3%)	
7	Product Shape	(m) Package Shape	3/90(3%)	

TABLE 4: Modes of comprehension by focus group for visual elements of packaging

Several findings can be drawn from Table 4: In the process of comprehending food packages, the majority of group members would rely on the visual message formed by more than two visual elements of packaging in order to comprehend a product. Apart from the cases where food packages have easy-to-understand visual elements (e.g.: renowned brand, actual product appearance, shape of package...etc.), group members were unable to comprehend sufficiently based on any single visual element. We learned from Table 4 that “typography + illustration” is the best mode for group members to comprehend products. That is, if design and marketing personnel use typography as the major visual element and illustration as minor in communicating the information about package contents, they will be able to promote comprehension of products to a greater extent.

In addition, “typography + product shape” and “product shape + illustration” are secondary modes of comprehension. As can be seen in Table 4, brand name and product name are regarded as the first choice by focus group members in comprehending product contents (72%). Furthermore, if the food package has a certain “shape”, it will be an element easier for focus group members to comprehend. This research also shows that package shape has become the second choice in comprehending product contents (22%). We should also note that among the comprehension modes of visual elements, group members are used to seeing actual product appearance to ensure the package contents.

Among the different modes of comprehension, focus group members found visual elements such as typography (brand name, product name), product shape (package shape), illustration (product image, actual product appearance) and color (color association) all contributed to the comprehension of products; while visual elements such as attached product information design, auxiliary packaging material design, texture design, structure design, and volume design would not make such comprehension easier. The findings above can be used as reference for related industries when formulating product marketing plans and designing packages.

5. CONCLUSION AND SUGGESTION

From the literature, it is learned that typography, shape, color, and pattern will influence consumers' buying decisions; however, their comprehension modes are scarcely mentioned. This study also showed how people comprehend the contents of products. They mostly need more than two visual elements to comprehend the messages of packaging. Among them, “typography + illustration” is the best mode for group members to comprehend products. These results are different from past studies that believed a single design element is more advantageous. In fact, the study results have shown that consumers' comprehension modes include “typography”, “typography + product shape”, “product shape + illustration”, “illustration”, “product shape + color”, and “product shape”. That proves the design elements such as brand name, product name, package shape, product image, and color association all greatly contribute to the comprehension of products and help with consumers' buying decisions. As the packaging of the food with wide publicity is well-known, all the results are applicable only to the research or applications of package design for new products or ones fewer consumer have heard about.

Through conducting the focus group interview, it is learned that the messages formed by combination of design elements will influence the comprehension of focus group members. Different types of comprehension also illustrated the percentage adopted by the samples in this research. When marketing personnel and designers are using packaging as a marketing tool to arouse consumers' buying desire, it will be advisable to take into consideration how design elements were to be combined in order to attract consumers' attention and to enhance their comprehension. In this study some products may need only one visual element for consumers to comprehend all because their brand names have been well-known. Moreover, the tendency to transparent package containers has instead provided designers another opportunity of design in

giving texture treatment on the surface of package materials, or adding light colors on the transparent package to create novelty.

Although the procedures, method and analytic strategy of this research can be used as a reference for marketing and package design, there are a few issues this research has neglected to consider, stated here as reference for future researches: (a) In view of the vast number of food packages, this research adopts the stratified sampling method and selected 90 samples for discussion; even though seven modes of comprehension have been identified through focus group discussions, it is possible that when taking into account more samples, other modes of comprehension will also emerge. This should be further thought out in future studies. (b) This research identified package design elements such as typography, image, shape and color as helpful to the comprehension of products by focus group members; however it failed to further identify which combination of design elements can be comprehended in the shortest period of time. This would provide a further area of study for fellow researchers to conduct a more in-depth experiment.

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