



# RESEARCH ON FORMS OF COMPREHENSION DERIVED FROM VISUAL COMMUNICATION OF PACKAGE DESIGNS

Regina W.Y. Wang <sup>1</sup> and Mu-Chien Chou <sup>1</sup>

<sup>1</sup>Graduate School of Design, National Taiwan University of Science and Technology, Taipei, Taiwan,  
[wyw@mail.ntust.edu.tw](mailto:wyw@mail.ntust.edu.tw); [f1234860@ms36.hinet.net](mailto:f1234860@ms36.hinet.net)

## ABSTRACT:

During the sourcing stage, how would consumers first determine what they want amongst a vast array of products to then gain further comprehension? Undoubtedly, visual communication of package design plays a major role in conveying messages to consumers.

In order to explore how well consumers comprehend messages that underlie the package designs of food and beverages, this research is designed to conduct in two phases. Phase One involves gathering samples of food and beverage packaging; Phase Two consists of holding Focus Group interviews, where we categorized the samples into mini-groups based on their shopping frequency, and interviews were then conducted.

Thirteen forms of comprehension were identified from the focus group study. The research results are: (a) focus group members would study more than two design elements to comprehend the packaging; (b) brand name and product image are the best sources to understand product messages; (c) brand name, product name, product image, package shape, color association all contributed to the comprehension of products; however, design elements such as manufacture trademark, package size and its texture do not facilitate in the understanding of products. The findings above can be used as reference when planning product marketing and designing packages.

**Keywords:** Food and Beverage Package, Visual Communication Design, Comprehension

## 1. INTRODUCTION

Recent researches show two-thirds of consumers' buying decisions were made on the actual site of purchasing (Schoormans and Robben, 1997; Weinberg and Gottwald, 1982; Rettie, 2000), making products stand out thus become the common goal sought by marketing personnel and package designers. "Packaging" plays the important role of a "silent salesman", it's a self-promoting marketing tool that attracts consumers' attention (Sara, 1990), and has proven to be stimulating sales volume. Examples can be seen from Dr. Bronner's shampoo, which did not undergo any advertising, yet its sales volume and market share continues to grow, all because of its packaging (Godin, 2003).

Good package design can correctly convey product messages, making it comprehensive for consumers. Designers formulate product packaging by using various design elements (e.g. texts, images, colors, trademarks, shapes, size and textures), making the products easy to recognize for consumers. Therefore, comprehensibility is the basic requirement for all package designs (Chen, 2005).

Product packaging is the most immediate stimulation that consumers come across. Consumers are selective of how different package designs stimulate them, the level of attention they pay to those packages are possibly different, furthermore, so are the level of information comprehended and retained. Even if the same product package was shown before the consumers, they could each have different interpretations during the comprehension stage. For example, when consumers see the "Coca-Cola" package design, some would register in the product by its brand: "Coca-Cola"; while some would register in the "Red color and the shape of the bottle". Designers

thus combine different design elements to convey messages through product packaging, on the other hand, consumers would interpret these stimuli based on their actual requirements and attitudes, different consumers would have comprehended differently.

This research aims at exploring how consumers comprehend product packaging based on their personal experiences, with a special focus and interest in establishing the relationship between visual design of packaging and comprehension.

By conducting focus group interview, this research collects information on how focus group members comprehend food products through different elements of visual package designs. Information gathered were then categorized and analyzed, to explore whether different package design would make any differences in consumers' level of comprehension. There are three main objectives in this research:

- a Explore by means of a focus group interview on how group members comprehend the visual messages conveyed through product packaging designs.
- b Taking results from abovementioned interview to further investigate which design elements when combined can deliver a more comprehensive message.
- c Establish the level of significance these design elements play when focus group members interpret the messages conveyed during the comprehension phase.

## 2. LITERATURE REVIEW

In view of exploring how consumers comprehend product designs, this research also looked into relevant literatures on consumers' "perceptual process" and "information processing", findings from these literatures were then further analyzed to facilitate the proceedings of this research.

### 2. 1. PERCEPTUAL PROCESS OF HOW CONSUMERS COMPREHEND PRODUCT MESSAGES

Marketing personnel and designers manipulate package design elements to convey product messages, those messages have to be crystal clear to the consumers, whether they'd be concrete or abstract messages. Most consumers come across a certain product in a very swift

product-searching process, they need to have an understanding on the product based on some comprehensive messages. For consumers, product package designs must visually communicate what needs to be known in a glance.

Generally consumers would search for information they deemed helpful in reaching their own goals. They each favor different forms of visual communication types, format and ways of appearance. Some only focus on the price information, while some rely on the visual communication of product appearance, and some pay more attention to the after service, quality assurance and easy-to-use information (McClure and Ryans, 1968; Bauer and Greyser 1969; Hawkins, Best and Coney, 2004). In other words, consumers decide by themselves what forms of information they would see and notice, as well as associate certain meanings to these messages. Obviously, when marketing personnel and designers wish to convey product messages to consumers through packaging design, they would have to grab potential customers' attention by coming up with comprehensive designs.

Basically, consumers' perceptual process can be divided into three phases: exposure, attention and comprehension. Marketing personnel and designers display products by means of package designs, hoping to grab consumers' attention. Through visual messages conveyed by the combination of package design elements, consumers were stimulated to comprehend the actual product. Hence, if the product packaging can effectively expose the product, consumers can then proceed with the information processing. Once consumers were stimulated by the messages conveyed through package design elements, they would organize and categorize the information, to then elaborate on it and form an interpretation on the product, thus taking them to the comprehension phrase (Drever, 1965; Wilkie, 1994; Engel, Blackwell and Miniard, 1995).

## 2. 2. INFORMATION PROCESSING OF PACKAGE DESIGN IN COMPREHENSION PHRASE

Package design can stimulate consumers' attention, giving them a chance to comprehend the product. Consumers comprehend a product by taking the visual messages conveyed through packaging design elements and "interpret" them. This interpretation process involves three basic procedures: organizing, categorizing and elaboration. Only through these three procedures, would the interpretation process be compete (Wilkie, 1994).

When package design (a) has been exposed (b), thus attracting attention (c), consumers would take the visual stimulation gained from specific design elements or combinations of these elements, organize the information and categorize it. Then, they would base on their personal experiences and elaborate on some certain characteristics of stimuli (d), to thus help them in comprehending the product (Hawkins, Best and Coney, 2004). Furthermore, while memories can influence the information we're exposed and attracted to, as well as our interpretation on the information received, the information we received would also generate new memories (e) (Hawkins, Best and Coney, 2004). This can prove that the interpretation process stimulated by the messages is highly related to the memory function, when consumers receive the messages and formulated them to form impressions, this impression would also help to interpret further information or be used for making purchase decisions (f) (Engel, Blackwell and Miniard, 1995). This research utilizes the information processing flow of how consumers perceive product package designs (Fig. 1) as the theory basis for further research on the forms of comprehension derived from product visual communication designs.

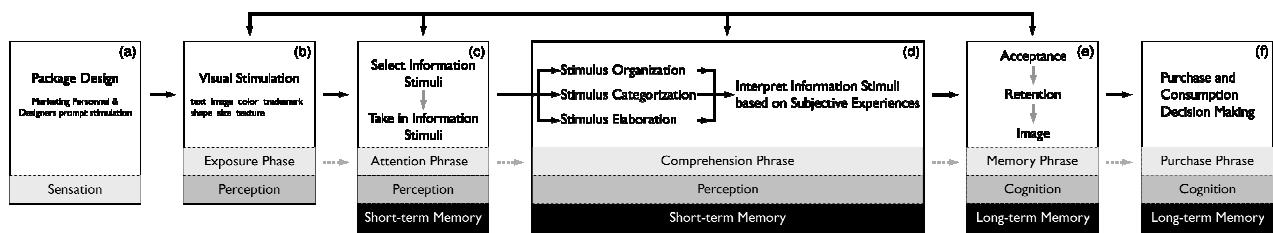


Figure 1: Information Processing Procedure of how consumers perceive product package designs (Drawn based on findings from literature review)

### 3. RESEARCH METHOD

For any new product packaging, regardless of whether it's at the initial concept stage or final formulation stage, focus groups are usually used to get feedbacks from consumers. In other words, focus groups are used to gather information on consumers' demands, as well as maintaining objectivity in identifying the good and the bad in package design elements (Stewart and Shamdasani, 1990; Greenbaum, 1993).

This research is aimed at finding out how consumers comprehend a product when they first come in contact with it. The intuition and experience consumers rely on for comprehending products are thus the results this research is set out to find. With this in mind, this research takes food package design as an example, through focus group interviews, explores "the forms of comprehension

derived from Visual Communication of Package Designs". This research is conducted in two phases: Phase One involves collecting food package samples; Phase Two consists of conducting focus group interviews. Respective details are as follows.

### 3. 1. COLLECTING FOOD PACKAGE SAMPLES

This research takes food package design as the sample source for exploring consumers' comprehension behavior. 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 adopts the stratified sampling method in collecting the actual samples. Below is a summary of where the package sources were collected, time of sampling and sampling procedures:

- a Package sources were collected from "Top Eighty Percent Best Selling Normal Products Chart"<sup>1</sup> referred by Foodstuff Department, RT-MART Branch.
- b Above information was obtained for December 2006 (1st ~ 31st Dec.).
- c This research adopts the stratified sampling method to identify 90 samples from a pool of 2,867 products in the "Top Eighty Percent Best Selling Normal Products Chart".
  - i) Sources can be divided into 30 product categories and 166 product classes, totaling 2,867 items.
  - ii) The number of product classes were first identified based on product category, the number of items in each product class was then further classified (Table 1). The class with most items was selected from each category as the sampling representative for that particular category.
  - iii) From the sampling representatives, top 3 best sellers of the product class were selected as the actual samples of this research, totaling 90 food packages.

Table I: Summary of Food Package Samples

Category	Class [Item Number]	
	Sampling Representative	
1 Refrigerated Foodstuffs	<b>Wheat Products [25]</b>	Vegetarian food [22] Bean Products [16]

		Refrigerated Seasoning [13] Rice Products [9] Vegetable Products [5]
2 Fresh Juice	<b>Fresh Juice [36]</b>	Tea & Coffee [18] Soy/Rice & Peanut Milk [12] Jelly [8] Pudding [6]
3 Milk	<b>Fresh Milk [22]</b>	UHT Milk [13]
4 Yoghurt	<b>Fermented Milk [21]</b>	Yoghurt Jelly [18] lactic acid drinks [9]
5 Cheese & Dairy Products	<b>Sliced Cheese [16]</b>	Blocked Cheese [12] Normal Butter/Paste [12] Processed Cheese [7] Others [5] Fresh Cream [4]
6 Egg	<b>Processed Egg [10]</b>	Egg [3]
7 Processed Meat Products	<b>Sausage &amp; hot dog [15]</b>	Ham/Bacon [10] Gift Box [1]
8 Frozen Foodstuff	<b>Pot [29]</b>	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]
9 Ice	<b>Ice Cream [29]</b>	Ice Stick [9] Ice Snack [8] Other Ice Products [5] Gift Box [3]
10 Tea & Coffee	<b>Green Tea [15]</b>	Milk Tea [12] Flavored Tea [12] Coffee [9] Oolong Tea [8] Jasmine Tea [8] Black Tea [6] Lemon Tea [5] Tea [5]
11 Juice	<b>Juice [31]</b>	Fruit & Vegetable Juice [12] Pure Juice [7]
12 Longer Lasting Products	<b>Flavored UHT Milk [17]</b>	Soy Milk [12] lactic acid drinks [8] UHT Milk [7] Instant Sweets[5] Gift Box[2] Nutritional Milk Products [1]
13 Beverage	<b>Soda [25]</b>	Mineral Water [20] Vinegar drinks [12] Sports Drinks [9] Cola [8] Functional Drinks [8]
14 Candy	<b>Chocolate [72]</b>	Candy [42] Chewy Candy [26] Chewing Gum [19] Gift Box [7] Counter[1]
15 Cookie	<b>Multigrain Cookie [94]</b>	Corn & Potato Snacks [80] Waffle [73] Rice Cookies [21] Gift Box [5]
16 Oriental Snacks	<b>Fish [28]</b>	Jelly [26] Bean Curd [21] Preserved Fruits [20] Nuts [20] Western Nuts [16] Meat [14] Gift Box [4]
17 Wheat Products	<b>Instant Noodles [96]</b>	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]
18 Alcohol	<b>Red Wine [69]</b>	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]
19 Soy Sauce Seasoning	<b>Soy Sauce[44]</b>	Chili Sauce [25] Seasoning [20] Noodle Sauce [17] Mayonnaise [11] Tomato Sauce [3]
20 Flavor Seasoning	<b>Seasoning [55]</b>	Monosodium Glutamate [18] Sugar[16] Vinegar [12] Honey [11] Sesame Oil [10] Fructose [5] Salt [4]
21 Oil	<b>Oil [17]</b>	Olive Oil [7 ] Sunflower Oil [5] Grape Seed Oil [5] Salad Oil [4] Vegetable Oil [3] Peanut Oil [3] Animal Oil [1] Others [1]
22 Canned Foodstuff	<b>Fish[41]</b>	Pickles [25] Fruits [13] Soup [12] Others [12] Gluten [11] Vegetable [11] Meat [8] Dried Meat Flakes [10]
23 Rice	<b>Rice [29]</b>	Others [22] Flour [6]
24 Milk Powder for Adults	<b>Functional Milk Powder [25]</b>	Non-/No Fat Milk Powder [8] Whole Milk Powder [7]
25 Baby Food	<b>Baby Foodstuff [14]</b>	Baby Flour [13] Follow-Up Milk Powder [10] Baby Milk Powder [9] Infant Milk Powder [8] Nutritional Supplements [6]

26	Flour	<b>Paste [27]</b>	Rolled Oats [22]
27	Tea Leaf	<b>Bagged Tea [51]</b>	Canned Tea [42]
28	Nutritional Foodstuff	<b>Healthcare [33]</b>	Chicken Essence [19] Vitamins [11] Four Herbs Drinks [9] Biochemials [1]
29	Coffee	<b>3-in-1 Coffee [36]</b>	Coffee Beans [15] Instant Coffee [12] Cream [8]
30	Other Flavored Foodstuff	<b>Multigrain Powdered Drink [44]</b>	Instant Drinks[10] Gift Box [9]

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

### 3. 2. CONDUCTING FOCUS GROUP INTERVIEWS

This research adopts the “focus group interview” method to gather personal experiences and perception of group members on the subject of “Forms of comprehension derived from Visual Communication of Package Designs”. Focus group members discussed amongst themselves on what forms of food packaging elements would influence their comprehension. Through categorizing and analyzing research data, the relationship between visual communication of package designs and consumers’ comprehension was thus identified. The details of how focus group interview was conducted are as follows.

#### 3. 2. 1. SELECTION OF FOCUS GROUP MEMBERS

The mini group members were selected based on their shopping frequency (those who shops at retail stores at least once a week were chosen), six members aged 20-25 volunteered to participate in the focus group. Before focus group interview was conducted, pre-test was done to ensure group members are able to distinguish between different forms of products.

#### 3. 2. 2. CONDUCT FOCUS GROUP INTERVIEW

The researcher act as the moderator in this interview, guiding focus group members through the discussion on visual communication of food package designs. Photos of samples were taken and shown through the computer screen, one food package is discussed at a time, totaling 90 times. The focus group interview conducted by this research lasted for approximately 120 minutes. Outline of the interview is as per Table 2.

**Table 2: Interview Outlines on Comprehending Visual Communication of Product Package Designs**

---

- Interview Outline
  - a You all should have the experience of buying a product, let's talk about what kind of things would affect your comprehension when you see a food product package? (If the group fails to engage in a discussion, ask for the importance of each of the following elements):
    - texts on the package
    - color coordination on the package
    - shape of the package
    - texture of the package
    - images on the package
    - manufacture trademark on the package
    - size of the package
  - b Let's look at the picture of the real samples, please tell me how you comprehend Product #1? (Further question: "Why?", and collect by what design elements do group members comprehend through group discussion. Repeat this process for 90 times)
  - c Do you have any other personal comprehension experiences which we haven't talked about that you'd like to share with us?
- 

### **3. 2. 3. ANALYZE FOCUS GROUP INTERVIEW DATA**

The proceeding of this interview has been documented by the researcher who is also responsible for the data collection. After the focus group interview, the record of how these six group members comprehend information was coded and entered into the computer. Two data analysts then proceed with the categorization of data independently, who then discussed after they have each finished their own categorization to make sure of the categories. Finally, the research aim was reconfirmed to see if it is in line with these categories.

## **4. RESEARCH RESULTS**

Focus group starts their discussion from elements that affect their comprehension of food packaging. In the event that group members didn't voluntarily share other design element factors, the moderator has to name a few elements accordingly and prompt for discussion, so to provide a more complete selection of choices for the group members on the subject of comprehending visual communication of food package designs. Group members all have a chance in voluntarily discussing the most important factor for them in comprehending products, or the method by which they comprehend products.

Focus group members provided a generous amount of their personal experiences and understanding on the 90 food package samples. From this research, we found information

exposed on brand name or product name plays a major role in the comprehension of food packages. As to what product design elements form a more comprehensive visual message, the answer varies from category to category. This research result is based on the majority of opinion gathered from the focus group interview. There are thirteen forms of comprehension derived from the food package samples, summarized in Table 3.

Table 3: Summary on forms of comprehension by focus group on visual communication of food package design

	Comprehension Type	% of Samples	Representatives
1	a. Brand Name b. Product Image = Brand Name + Product Image	17% (15/90)	  
2	a. Product Name b. Actual Product Appearance = Product Name + Actual Product Appearance	14% (13/90)	  
3	a. Brand Name b. Actual Product Appearance = Brand Name + Actual Product Appearance	12% (11/90)	  
4	a. Product Name b. Product Image = Product Name + Product Image	11% (10/90)	  
5	a. Brand Name b. Product Name c. Product Image = Brand Name + Product Name + Product Image	9% (8/90)	  
6	a. Renowned Brand = Renowned Brand	7% (6/90)	  
7	a. Package Shape b. Brand Name = Package Shape + Brand Name	7% (6/90)	  
8	a. Package Shape b. Actual Product Appearance = Package Shape + Actual Product Appearance	7% (6/90)	  

9	a. Actual Product Appearance = Actual Product Appearance	6% (5/90)	
10	a. Package Shape b. Color Association = Package Shape + Color Association	3% (3/90)	
11	a. Package Shape = Package Shape	3% (3/90)	
12	a. Package Shape b. Product Image = Package Shape + Product Image	2% (2/90)	
13	a. Product Name b. Package Shape = Product Name + Package Shape	2% (2/90)	

a "x/90" shows out of the 90 samples, x number of items belong to a certain comprehension type.

b "a" and "b" in the table above shows the first comprehension type is based on the visual communication messages formed by the combination of "a+b" design elements.

Several findings can be drawn from Table 3: In the process of comprehending food packages, the majority of focus group would rely on the visual message formed by more than 2 package design elements in order to comprehend a product. Apart from the cases where food packages have easy-to-understand design elements (e.g.: renowned brand, actual product appearance, shape of package...etc.), focus group members were unable to comprehend sufficiently based on any single package design elements (e.g. product image). Amongst all forms of comprehension on the visual messages of food product package designs, the combination of design elements: "brand name and product image" is most effective in delivering product messages. Thus we can conclude that food package designs when adopts the above combination would enhance consumers' comprehension towards products.

As can be seen from the samples, the top six either had brand name or product name as the primary element for comprehending a product. When focus group members were comprehending food packages, seventy-two percent of them rely more on the "Text" form of comprehension in the design elements. Furthermore, if the food package has a certain "package shape", it would be an

element that's easier to comprehend for focus group members. This research also shows that twenty-two percent of the members rely more on the "package shape" design element, while the rest six percent rely on the actual appearance of the food itself, and shows no direct association with the package design.

Amongst the different forms of comprehension sources, focus group members found design elements such as texts(brand name, product name), images(product images), shape(package shape) and color(color association) contribute to the comprehension of products; while design elements such as manufacture trademarks, package size and its texture 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

Through conducting the focus group interview, how group members comprehend the visual message delivered by package design has been identified. Furthermore, from collecting and analyzing the data, which design elements when combined can enhance consumers' comprehension has also been examined. From the discussion result by focus group members on the 90 food package design samples, thirteen forms of comprehension sources can be identified, and the summary of the research findings can be drawn as follows:

- a For most group members, comprehending a food package would require more than two design elements. For example, product message delivered through the combination of "brand name and product image" is best comprehended.
- b Brand name, product name, product image, package shape, color association all contributed to the comprehension of products; however, design elements such as manufacture trademark, package size and its texture do not facilitate in the understanding of products.

As the abovementioned results show, message formed by different combination of design elements would influence the understanding of focus group members. Different forms of comprehension also illustrated the percentage adopted by the samples in this research. Thus, if marketing personnel and designers were to use packaging as a form of marketing tool to induce consumers' buying demand, it would be advisable to take into consideration how design elements were to be combined in order to attract consumers' attention and to enhance their comprehension.

Although the procedures, method and analysis strategy of this research can be used as a reference for marketing and package design people, 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 there were thirteen forms of comprehension been identified through focus group discussions, it is possible that when taking into account more samples, other forms of comprehension would also emerge. This should be further thought out in future researches. (b) This research identified package design elements such as texts, images, 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.

## FOOTNOTE:

<sup>1</sup> “Top Eighty Percent Best Selling Normal Products Chart” for Dec. 1st ~ 31st, 2006 refers to the sales ranking of products not undergoing any promotion events. Contents of the items sold, market share, product preference and turn over rate can be seen from the summary chart.

## REFERENCES:

- Bauer, R. and Greyser, S. (1969). *What Americans Think of Advertising*. New York: Dow Jones-Irwin.
- Chen, Y. C. (2005). A Study on Comprehensibility and Interestingness of Design from Visual Trope. *Journal of National Taiwan College of Arts*, Vol. 77, 1-11.
- Drever, J. (1965). *A Dictionary of Psychology*. Baltimore, Maryland: Penguin Books, 42.
- Engel, J. F., Blackwell, R. D. and Miniard, P. W. (1995). *Consumer Behavior*, eighth edition. New York: Dryden Press.
- Godin, S. (2003). *Purple Cow: Transform Your Business by Being Remarkable*. New York: Penguin Group.
- Greenbaum, T. L. (1993). *The Handbook for Focus Group Research*, edition rev. and expanded ed.. New York: Lexington Books.

- Hawkins, D. I., Best, R. J. and Coney, K. A. (2004). Consumer Behavior: Building Marketing Strategy, ninth edition. Boston: McGraw-Hill, Irwin.
- McClure, P. J. and Ryans, J. K., Jr. (1968). Differences between Retailers' and Consumers' Perceptions. *Journal of Marketing Research*, Vol. 5, Iss. 1, 35-40.
- Rettie, R. and Brewer, C. (2000). The Verbal and Visual Components of Package Design. *Journal of Product and Brand Management*, Vol. 9, No. 1, 56-70.
- Sara, R. (1990). Packaging as a Retail Marketing Tool. *International Journal of Physical Distribution & Logistics Management*, Vol. 20, No. 8, 29-30.
- Schoormans, J. P.L. and Robben, H. S.J. (1997). The Effect of New Package Design on Product Attention, Categorization and Evaluation. *Journal of Economic Psychology*, vol. 18, 271-287.
- Stewart, D. W. and Shamdasani, P. N. (1990). Focus Groups: Theory and Practice. Newbury Park, CA: Sage Publications.
- Weinberg, P. and Gottwald, W. (1982). Impulsive Consumer Buying as a Result of Emotions. *Journal of Business Research*, Vol. 10, Iss. 1, 43-57.
- Wilkie, W. L. (1994), Consumer Behavior, third edition. New York: John Wiley & Sons, Inc.