

## IMPACT OF PACKAGING' COLOR ON PHARMACEUTICAL PRODUCT PERCEPTION AND CONSUMER BELIEFS

AMEL ARABI

PH.D. STUDENT, FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION,  
DEPARTMENT OF MARKETING, WEST UNIVERSITY OF TIMISOARA, ROMANIA  
amelarabi@hotmail.com

**Abstract:** Design packaging and in particular its color is often evoked by the consumer as a reason justifying the desire or not to consume the offered product. Colors are considered as a dominant component of design. They are one of the most immediate ways to deliver messages. Indeed, studies have shown that color can retain attention, affect consumer perception, stimulate emotional responses, and improve learning. This article studies the impact of packaging color on consumer behavior towards analgesic. How consumer perceive a packaging of medication, and how the associative learning influences his beliefs towards the efficiency of a medication, and also we study the impact of the prior experience on the association color/ design judgments towards the products. In our study we choose analgesic for its current use between individuals; we will present images of packaging in different colors to participants, after observing those images they have to answer to a questionnaire. Usually, individuals (consumers) they do not really have the choice to chose a packaging for a medication at a pharmacy, but if they are used to a specific medication, then they should be familiar with its packaging color; so we want to know if a different color for the same product packaging could have an influence on their beliefs towards the efficiency of it.

**Key words:** Packaging, Color, Pharmaceutical product, Product perception, Associative learning.

**JEL classification:** M31, L65, M39

### 1. Introduction and context of the study

Colors convey psychological messages that vary from one person to another. These messages influence the product' perception itself, which generates emotions, cognitive responses, and different attitudes from one consumer to another. Indeed, the consumer develops a belief system based on his previous experience and associative learning. The main objective of our research is to provide answers to the following question: how does the color of design packaging influence consumer behavior towards a pharmaceutical product? Therefore, we will study the impact of packaging color on consumer perception and judgments towards an analgesic.

According to literature data, the experience of consumer with different packaging designs, allows him to associate them with certain given colors and to judge them appropriately. Experience and associative learning make the consumer automatically link certain colors to certain product designs. Any color changing can influence the consumer's judgment for this product. Consumer preferences can develop by associative learning process; the past experience with products would determine consumer preferences. Indeed, (Grossman and Wisenblit, 1999) argue that individuals' preferences depend on two things: positive prior experience and associative learning. Either the preference for a color would come from a previous positive experience with that color, or the preference would come from learning that some colors are more appropriate than others for one type of product. Associative learning would affect consumers' color preferences; however, the authors believe that the favorite color would not sufficiently explain consumer choices for product color, as they have developed a large number of color combinations for many products. According to (Kreitler and others, 1972, cited by Grossman and Wisenblit, 1999), the associative learning that would be the basis of consumer preferences should be more taken into account by marketers as it would be a basis to understand the emotional aspect of colors.

Color helps us to better understand and remember information when used appropriately and effectively. Each color has a meaning that varies from one consumer to another. It influences the way of seeing and processing information. It improves the ability to remember words and images and is considered a vital factor in memory retention. The consumer uses a different color to highlight each subject, identify specific colors by theme, by details. That way, when he needs, he can close his eyes and imagine the color to help remember the information more easily. A mental image is much easier to remember than its auditory or textual equivalent. According to (Ingarao, 2004), the consumer has mental images of the design packaging he has been confronted with; for the consumer, these representations are symbolized by a prototype that comes from his previous experience with the product' design (Crilly and others, 2004). Consumers can make comparisons between a design and their visual references. These depend on the personal experience of each consumer. Indeed, the consumer would compare the product design packaging itself with its product category stereotypes (Crilly and others, 2004).

(Jacobs and Nordan, 1979) analyzed the effects of the color of placebo medications; "a preparation free of any active ingredients prescribed instead of a medicinal product for its psychological effect on the patient"; One hundred subjects had to classify according to three categories of medicinal effects, six kinds of capsules of different colors. According to results, tranquilizers and depressants were related to (blue and black) stimulants and antidepressants (red and yellow). White and green were not related to a particular class. According to (Gallen and Sirieix, 2007), it would seem that the characteristics attributed to a product vary according to the color of the packaging; Also, the color generates an influence on consumer' feelings, the color of a product can modify the perceived quality and beliefs. Also, according to a study conducted by (Dandouau and Lichtlé, 2008); the more a color is perceived as non-congruent with the product, the more negative consumers' beliefs and attitude will be, meanwhile, the more a color is perceived as congruent with the product itself, the more will consumer have positive attitudes.

In this research, we study the influence of packaging color on consumer behavior, more specifically, we will analyze how consumer perceive a packaging of a medication; in our study we choose analgesic for its current use between individuals; we will present images of packagings in different colors to participants, after observing those images they have to answer to a questionnaire. Usually, individuals (consumers) they do not really have the choice to chose a packaging for a medication at a pharmacy, but if they are used to a specific medication, then they should be familiar with its packaging color, so we want to know if a different color for the same product packaging could have an influence on their beliefs towards the efficiency of it.

## 2. Methodology

According to informations gathered in the literature, we were able to determine that the packaging designs are estimated very differently according to the consumers who evaluate them. Thus, the color plays a key role in the appreciation and the choice of a design. The purpose of this research is therefore to study the impact of the packaging color on the perception, and information's memorization of the consumer. Also, the role of associative learning on the choice and preferences of colors. Our hypotheses stem from literature data on the relationship between packaging design, colors and their influence on consumer behavior.

However, the effect of color sometimes passes through other variables such as judgments which themselves develop mainly according to the consumer age and gender, his culture and his previous experience with colors; so these judgments will later influence the choice as well as the consumer behavior. The conceptual models that guide research into the influence of color on consumer behavior are stimulus-organism-response models. A general model of research on the influences of design, also the influence of colors on consumer responses is proposed by (Horváth, 2001) in figure 1. According to the theoretical data previously studied; so the packaging design' color could respond to the consumers preferences it must integrate several elements. Some authors (Roullet, 2004); (Holmes and Buchanan, 1984, cited by Grossman and Wisenblit, 1999) have

shown that consumers' favorite colors depend on the product itself and that these preferences are independent of their favorite colors.

In our study we focus on pharmaceutical products, we set our research on consumer preferences for colors to determine the impact of these on his perceptions and beliefs. For this, we proposed the following hypothesis:

H.1: color preference influences the choice of product design.

H.2: The choice of the packaging color varies according to consumer gender.

H.3: Previous consumer experience determines its associations color / packaging design.

H.4: colors influence memorization.

In order to determine the impact of design' color on consumer behavior, a quantitative survey was conducted to establish a link between these colors and their influence on the perception of the product. For this, we studied design packaging of pharmaceutical products (medication). In our study, we didn't use placebo medication; we used images of medication packaging in different colors. The study is conducted on a multicultural population of 203 individuals, women, and men of different age, groups, nationalities and professions.

### **2.1. The choice of product**

The study has been conducted on medications (analgesic). The choice of these packaging products will allow us to estimate the colors impact on the evaluation and the judgments toward the product itself. The product is consumed by a large number of people and is very familiar to them; which increases the chances to obtain significant results. The packagings are presented to respondents in form of images modified using the Adobe Photoshop CC (version 2017.0.1) program, in order to remove any mark or symbol that could skew the results.

### **2.2. The choice of colors**

More specifically, we are interested in the dominant color of the packaging design. We inquired about the predominant colors for analgesics. After having been informed about the predominant colors used for packaging of analgesics. We chose eleven colors: red, orange, yellow, green, blue, purple, pink, brown, grey, white, black. It will be necessary to present the possible number of colors to be sure that the favorite color of each individual is represented. In addition, some colors may be considered appropriate or not to the products presented.

### **2.3. Data collection (questionnaire administration)**

The questionnaire would be the most appropriate tool to gather the information needed to test our research hypotheses that reveal links and influences of certain variables on others.

The questionnaires were administered in January 2017 to a multicultural sample of different age groups. In order to avoid false answers, we asked the respondents if they suffered from trichromatic vision problems such as daltonism. And if they were used to take analgesics, and how many time per year, we also asked them about which color is the packaging of the medication they were used to take.

The questionnaire was translated into three languages successively: French, English and Arabic; and were distributed locally and also administered online (electronic version) via social networks as well as by email, in order to get the participation of a large number of respondents from different nationalities / cultures. A pre-test of the questionnaire was first tested on 4 subjects: two men aged 25 and 50, two women aged 30 and 50, in order to ensure a good understanding of the questionnaires. Each component was presented in such a way that the respondent will either have to choose one of the different colors proposed, or make an assessment using Likert scales. These were presented with an odd number of checkboxes so respondents could answer without deflecting the study. In order to analyze the data collected, we used the XLSTAT statistical data analysis computer program (2018.1)

### 3. Discussion of results

#### ❖ Favorite color for participants

According to the analysis of results about which color is favorite for the participants in our study we observe that blue is predominant (22.7%), followed by pink (19.7%), red (15.8%), black (14.8%), purple (9.4%), green (8.9%), white (3%).

#### 3.1. Analgesic packaging color and gender:

The chi-square test, and Fisher' test were performed to test whether the preferences and colors chosen for the medications vary by gender, so we selected the most favorite colors (black, blue, red and white) among men and women according to our study.

**Table.no.1: Analgesic color packaging and gender:**

	Black	Blue	Red	White
<b>Man</b>	12	5	16	18
<b>Woman</b>	9	23	45	33

*Source: Calculated by the author based on data from XLSTAT.*

Since the calculated p-value is less than the  $\alpha = 0.05$ , we must reject the hypothesis  $H_0$ , and retain the alternative hypothesis  $H_2$ . According to which the choice of colors and preferences varies according to gender.

#### 3.2. Color and analgesic packaging design

The following table (2) shows the results for the favorite colors and the colors chosen for an analgesic medication. We observe that 25 out of 203 people chose a color of packaging identical to their favorite color. Thus, out of 32 having red as the favorite color, 11 have chosen an identical color for the analgesic packaging. Also, out of 46 having blue as the favorite color, only 5 chose an identical color.

**Table.no.2: favorite color / chosen color**

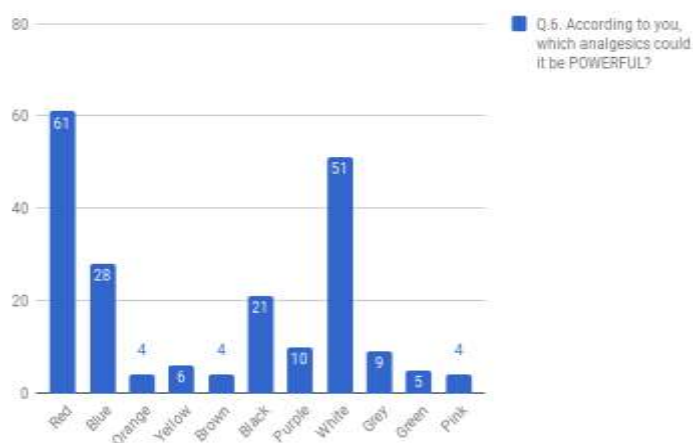
	Black	Blue	Brown	Green	Grey	Orange	Pink	Purple	Red	White	Yellow	Total
<b>Black</b>	3	2	1	2			1	3	8	8	2	30
<b>Blue</b>	5	5	1	1	4		1	4	14	10	1	46
<b>Brown</b>			1						1	1		3
<b>Green</b>	3	1			1	1			4	8		18
<b>Grey</b>		1							1	1		3
<b>Orange</b>		1							1	1		3
<b>Pink</b>	5	12	1	1	1	2	1		7	9	1	40
<b>Purple</b>	1	3						2	11	2		19
<b>Red</b>	3	2		1	2	1	1	1	11	9	1	32
<b>White</b>	1	1							2	1	1	6
<b>Yellow</b>					1				1	1		3
<b>Total</b>	<b>21</b>	<b>28</b>	<b>4</b>	<b>5</b>	<b>9</b>	<b>4</b>	<b>4</b>	<b>10</b>	<b>61</b>	<b>51</b>	<b>6</b>	<b>203</b>

*Source: Calculated by the author based on data from XLSTAT.*

According to results: (chi-square = 83.185), ( $p = 0.888$ ), we cannot reject the hypothesis of independence between variables and therefore reject hypothesis  $H_1$  according to which color preference influences the choice of product design.

#### 3.3. Previous experience and analgesic packaging design

According to results, the participants chose red as the packaging containing the most powerful analgesic by respectively: red, white, blue and black.



**Fig.no. 1: Color chosen for the packaging of a powerful analgesic**

Source: Calculated by the author based on data from XLSTAT.

We want also to study if the previous experience determines the association color / design packaging so we considered the results between (color of the packaging already used and colors selected for the packaging chosen as the most powerful):

**Table.no. 3: Previous experience and medication packaging design**

	Black	Blue	Brown	Green	Grey	Orange	Pink	Purple	Red	White	Yellow
Black	4	1	0	0	0	0	0	1	1	1	0
Blue	2	17	1	0	0	0	0	0	4	1	0
Brown	0	0	0	0	1	0	0	0	1	0	0
Green	1	1	0	0	0	1	0	0	2	0	0
Grey	3	0	0	0	3	0	0	2	4	2	1
Orange	1	1	0	0	0	3	0	0	0	1	0
Pink	0	1	0	0	0	0	2	1	0	0	0
Red	1	0	0	0	1	0	0	1	17	0	0
White	9	6	3	5	4	0	2	5	28	46	3
Yellow	0	1	0	0	0	0	0	0	4	0	2

Source: Calculated by the author based on data from XLSTAT.

According to results, (Chi-square = 321.495,  $p = 0.0001$ ). Since the calculated p-value is below the level of  $\alpha = 0.05$ , the hypothesis  $H_0$  must be rejected, and the alternative hypothesis  $H_3$  must be retained: according to which the consumer's previous experience determines his color / design associations. And hypothesis  $H_4$  according to which colors influence informations' memorization.

#### 4. Discussion of results

##### ❖ Hypothesis verification

H.1: color preference influences the choice of product design. Denied

H.2: The choice of the packaging color varies according to the gender. Confirmed

H.3: Previous consumer experience determines its associations color / packaging design. Confirmed

H.4: Colors influence memorization. Confirmed

The main objective of our research was to study and measure the impact of design color on consumer behavior. Thus, the results obtained confirm the existence of a significant influence of color as a design element on the consumer behavior. Indeed, red is chosen as the favorite color and the most appropriate for the packaging of an analgesic medication.

The results obtained highlight the existence of a link between gender and the choice and preferences of color for packaging design. We can say that the choice of color varies according to gender. Regarding analgesic packaging: red is dominant and chosen by (25.8%) men and (31.9%)

women. According to the results obtained, the choice of the color of the packaging varies according to the type of product itself but also the preferences vary according to consumer gender.

The consumer's previous experience with product design and associative learning, allow him to associate them with certain given colors and to judge them appropriate. Experience makes consumer automatically links certain colors to certain product designs. The consumer has mental images of the product design he has been confronted with; For the consumer, these representations are symbolized by a prototype that arises from his previous experience with the design product (Crilly and others, 2004); An individual who buys for example an analgesic which packaging is red or white will therefore tend to tolerate more an analgesic of this colors (red, white) when faced with a new packaging color, which is the case in our study when the participants chose the red, white as packaging containing the most powerful analgesic, which is interesting because when we asked what color was the analgesic packaging they used to take, the colors mentioned were white and red, in addition to blue. On this fact, therefore, the prior experience of the consumer influences his mental representations, his beliefs towards the medication and its efficiency.

## 5. Future research direction

In our next study we will study another product category, and study food packaging, we will study the influence of design color on the product taste, quality and price perception; and try to understand and analyze more the psychological and physiological effect of colors on consumer behavior. We also, will enlarge our research and study the impact of culture on color preferences and consumer behavior.

## 6. Conclusion

Color is ubiquitous and considered as a main source of information for the consumer. Since the first visual contact with the product, the consumer is instantly attracted to color, so he identifies the product and evaluates it. The sensation of color is the first stimulus facilitating the perception of the product by consumer, it contributes to product differentiation in linear, so it plays a primordial role because it influences, generates emotions, beliefs and attitudes, which could be positive and/or negative, towards the product. Color is essentially the first element followed by the shape, which makes it possible to identify and recognize a product. In our research, we focused on packaging color of pharmaceutical product (analgesic), frequently used by individuals; we wanted to study the impact of its packaging color on its efficiency perception. As well as the capacity and influence of associative learning on consumer judgments towards this kind of products.

The statistical analysis of the results confirms the existence of a color influence on the perception of the product and consumer behavior. Following the results obtained, we conclude that color is an essential element in marketing; it generates beliefs and influences the judgment, as well as the choice of the consumer. The general color preferences do not influence the choice of the consumer; but the colors of the packaging design are chosen according to the congruence between the design and the product itself, however the previous experience as well as the associative learning with the product and its color seems to play a decisive role in this process. The color of packaging design is a powerful tool that must be taken into account when innovating a product packaging or creating a new one for it could influence the efficiency perception and beliefs towards the product.

## 6. Bibliography

- [1] Arabi A.(2017), "Influence Of Colors On Consumer Behavior “Conceptual And Theoretical Approaches”, "Annals - Economy Series, Constantin Brancusi University, Faculty of Economics, vol. 3, pages 163-170, June.
- [2] Crilly, N., J. & Clarkson, P.,J. (2004). Seeing things: consumer response to the visual domain in product design *Design Studies*, 25 (6), 547-577.

- [3] Damasio, A. R., Grabowski, T. J., Bechara, A., Damasio, H., Ponto, L. L., Parvizi, J., & Hichwa, R. D. (2000). Subcortical and cortical brain activity during the feeling of self-generated emotions. *Nature neuroscience*, 3(10), 1049-1056..
- [4] Damasio, A. R. (2000). A second chance for emotion. In R. D. Lane & L. Nadel (Eds.), *Cognitive Neuroscience of Emotion* (pp. 12–23). New York, NY: Oxford University Press.
- [5] Damak L.(1996), Design du produit et corps du consommateur: Recherche de similarité ou de complémentarité ?Thèse de Doctorat, Université Paris Dauphine, France
- [6] Divard R. & Urien B., *Les Couleurs et le Marketing, un Etat des Recherches*, Cahier de Recherches N° 2, Laboratoire ICI, Université de Bretagne Ouest & ENST Bretagne, 2000.
- [7] Dzulkifli, M., Mustafar, M. (2013). The Influence of Colour on Memory Performance: A Review. *The Malaysian Journal of Medical Sciences*, 20(2), 3-9.
- [8] Grossman, R., P. & Wisenblit, J.,Z. (1999). What we know about Consumers' Color Choices. *Journal of Marketing Practice: Applied Marketing Science*, 5 (3), 78-88.
- [9] Gallen C. (2005), « Le rôle des représentations mentales dans le processus de choix, une approche pluridisciplinaire appliquée au cas des produits alimentaires », *Recherche et Applications en Marketing*, Vol. 20, No 3, pp. 59-76.
- [10] Horváth. D.,(2001), Role of Product Design in Product Related Consumer Judgements, Budapest University of Economic Sciences and Public Administration Budapest.
- [11] Holbrook& Ray Assessing the role of emotions as mediators of consumer responses to advertising, *Journal of consumer research*, vol 14, 1987.
- [12] Pantin-Sohier G. et Bree J. (2004), L'influence de la couleur du Produit sur la Perception des Traits de Personnalité de la Marque, *Revue Française du Marketing*, 196, 1/5, 19-32.
- [13] Pantin-Sohier G. (2009), L'influence du packaging sur les associations fonctionnelles etsymboliques de l'image de marque, *Recherche et Applications en Marketing*, 24, 2, 53-72
- [14] Pinto M.M.et Droulers D.(2014)-*Pakaging :enjeux,évolutions et perspectives stratégiques*, International Conference Marketing Trends,Volume 1,Fevrier,5-17
- [15] Pham, Michel Tuan, Joel B. Cohen, John W. Pracejus, and G. David Hughes (2001),“Affect Monitoring and the Primacy of Feelings in Judgment,” *Journal of Consumer Research*, 28 (September), 167-88.
- [16] Puissegur, A. (2014). *La perception visuelle : un facteur déterminant dans la reconstruction photo mimétique d'un sourire* (Thèse de doctorat).Université Toulouse III-Paul Sabatier.
- [17] Rouillet B., Ben Dahmane Mouelhi N., Droulers O. (2003), Impact de la couleur de fond sur les croyances envers le produit : une approche multi-culturelle, *Actes du 19e Congrès In-ternational de l'AFM Tunis*, Association Française de Marketing, 9-11 mai, pp.454-468.
- [18] Rouillet B. (2004), L'Influence de la couleur en Marketing. Vers une neuropsychologie du consommateur, *Thèse de doctorat en Sciences de Gestion*, Université de Rennes I.
- [19] Rouillet B. et Droulers O. (2005), Pharmaceutical Packaging Color and Drug Expectancy, *Advances in Consumer Research Conference Vol. 32* (texte complet), eds. Geeta Menon & Akshay R. Rao, Portland, U.S.A., p. 164-171.
- [20] Rouillet B., Droulers O. (2004), Couleur du conditionnement pharmaceutique et croyances envers le médicament, *Actes des 17èmes Journées Nationales des IAE*, Lyon.
- [21] Schifferstein, H.N.J.(2001) Effects of product beliefs on product perception and liking. In Frewer, L., Risvik, E., Schifferstein, H. *Food, People and Society. A European Perspective of Consumers' Food Choices*. Springer Verlag, London
- [22] Scherer, K. R., & Peper, M. (2001). Psychological theories of emotion and neuropsychological research. In F. Boller & J. Grafman (Eds.), *Handbook of Neuropsychology* (Vol. 5, pp. 17-48). Amsterdam: Elsevier.