

Verbal and Pictorial Stimulus of Package Design in Right-to-left Languages According to Brain Laterality

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1. Introduction

The form of the package itself can influence consumer perception. The components of the package can combine to communicate all sorts of informative and emotional messages. Informative messages include the brand logo, the product description, promotional messages, and usage directions. The emotional aspects offer a wide range of design possibilities, such as package colors, the style of logos, symbols, photographs and illustrations. Every word and every visual detail must be structured carefully in order to establish memorability for specific brands.

Enhancing brand equity, one of the objectives of marketing managers, is affected significantly by package design. Distinctive packaging ensures better recall of the product and especially of the brand name. Brand memorability is one of the most important factors in a brand name (Lee and Ang, 2003), because it reduces consumer search costs (Grace and O'Cass, 2005). Creating a high level of brand awareness and a positive brand image in consumer's memory maximizes brand equity (Dong and Helms, 2001). According to Lin, perceptual image plays an important role in forming consumer impressions (Lin, 2004). Brand image consist of brand cues such as name, logo, and packaging design. Research on recalling brands as memory target, gaining informed insight into familiar processes such as how we recognize visual cues, how we store or retrieve memories, and even why we forget, provides a useful foundation for brand psychology (Franzen and Bouwman, 2002).

But in this sense, the brand itself is not a memory target but a cue that might facilitate recall or inference of previously-learned brand associations (Warlop et al., 2005). To increase the recall of brand cues, we should consider the result of research on brain laterality which has shown that perception is not symmetrical. Although the two sides of the brain are similar in appearance, and every structure in each hemisphere is mirrored on the other, the functions of each cortical hemisphere are different. For our purpose, we can mention the differences between verbal and pictorial stimuli to the specialized functioning of the brain's left and right hemispheres (Holbrook and Moore, 1981). According to Janiszewski's research (1990),

verbal ads are preferred when placed on the right, and the converse is true for pictorial ads. This stems from the fact that the human nervous system is designed for each cerebral hemisphere to receive information primarily from the opposite side of the body. The right hemisphere is the more efficient processor of pictorial information and the left is capable of analyzing verbal information (Janiszewski, 1990). According to this brain laterality the positioning of the elements in a pack design is related to perception of those elements, recall or missing the elements while looking at them walking in a mall.

Moreover, there is some evidence that language differences may affect consumer information processing (Schmitt et al., 1994) not only in terms of mental representation, but also in the way they are organized and retrieved from memory (Tavassoli, 1999).

In this article we describe specific elements of package design to investigate and evaluate the maximization of pack recall through the positioning and layout of the elements of a pack in right-to-left languages.

2. Package design

As the marketing of consumer products becomes increasingly competitive, more companies are treating the product package both as a point-of-purchase advertising vehicle (Schwartz, 1975) and as a component of marketing and advertising (media, promotion, packaging, copy) (Hodock, 1980). In this situation, the high cost of developing appropriate graphics, shapes, and logos dictates the need to evaluate the package's effectiveness (Schwartz, 1975) and consumers' ability to retrieve brands and identify products in busy perceptual fields such as grocery stores aisles (Keller, 1991).

In Kumar's research, cueing the product with the pictorial contexts at a point of recall improved when pictorial contexts were less similar; this is another proof of the role of distinctive package design. The role of pack design changed with the move to self-service (Danger and Brookfield, 1987) and the pack became an essential part both of the selling process (Rettie and Brewer, 2000) and of selling power. The design of the pack itself may be an incentive to buy.

In one analysis of senior marketing managers, design was mentioned as the most important performance of a new product by 60 percent of respondents (Bloch, 1995). While packaging attracts attention and communicates objective and emotional information about the contents (Schwartz, 1971) there is an underlying thesis that packaging decisions should be driven by marketing rather than by aesthetic or artistic considerations (Danger and Brookfield, 1987). Despite the importance of brand differentiation as a competitive advantage (Aggarwal, 2002), and of visual attention as a vital and often the only way to acquire information about brands in consumer choice contexts, it has been disregarded in marketing research. In perceptual analyses, consumers examine sensory features of the stimulus, such as shape, color, and size; they decipher the stimulus into categorical codes, such as brand name, pictorial and verbal information for a brand package, and they select certain elements of the stimulus over others (Pieters and Warlop, 1999). According to managerial issues, the main point is that investment in design can be better matched to the anticipated target market to avoid either under- or over spending. Sales forecasts also might become more accurate if the centrality of product aesthetics to a market can be assessed and considered in light of the design characteristics (Bloch et al., 2003).

Of course, some individual, social, and situational characteristics (such as different genders and handedness) should be considered in perceptual experience (Friedmann and Zimmer, 1988). This involvement of the user makes the packaging an essential element in both the communication of brand values and as an essential part of the brand (Connolly and Davidson, 1996). Whether consumers remember a brand name, a brand image, or a benefit conveyed in an ad depends on several factors that marketers need to consider (Schmitt et al., 1993). Personal factors, such as needs, values, and motives, modify the message communicated by the packaging or the advertisement and advertising campaigns should reduce psychological distance between the self and the product image (Horowitz and Kaye, 1975).

Considering package design as an ad, and that a positive effect is transferred from ad to brand, led to the conclusion that ad likeability results in brand likeability (Fam and Waller, 2004), and making a brand strongly in customers' minds with very positive and relevant association (Baker et al., 2005) leads to more sales. As Schmitt et al. (1993) have mentioned there are different researches on ad memorability that has focused on the relative impact of pictorial information versus verbal information. Also according to their research on print advertisements three components a) visual information b) verbal information and c) brand name may be related to one another and memory also depends on the existing interrelations among different elements in the ads apart from their layout. Base on Janiszewski (1988), (1990) and Rettie and Brewer (2000), the layout (right/ left) of different elements has also some effects on the preference of that advertisement in left-to-right languages.

Packaging has to work in a more crowded competitive context both in the retail environment and in the kitchen (Thompson, 1996). An estimated half of all grocery purchases are unplanned, and according to a survey by the Henley Center, 73 percent of purchase decisions were made at the point of sale (Rettie and Brewer, 2000); it therefore seems that time pressure is another factor in supermarket purchases, so pack design has a great effect on decision making.

According to Tsai (2005), there is conceptual brand purchase model (Figure 1), in which repurchase intention of the brand is designated as the outcome construct, and brand purchase value, with the three dimensionalities of symbolic value, affective value, and tradeoff value treated as mediators, preceded by the juxtaposing constructs of perceived image, emotional experience, perceived quality, and price acceptability of the brand.

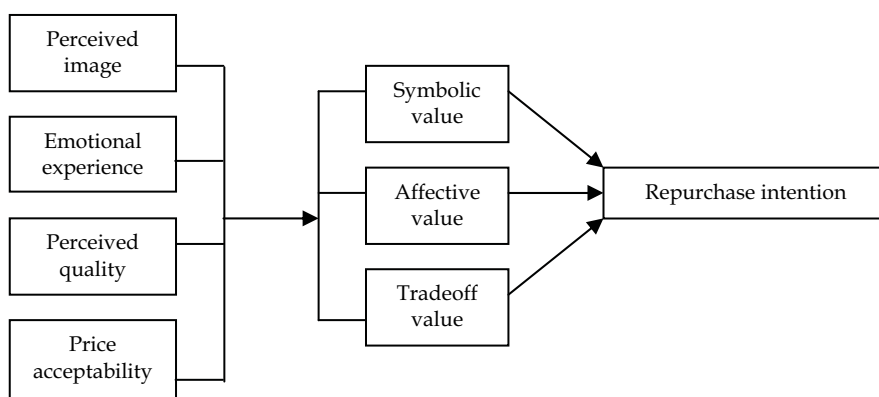


Fig. 1. Tsai's Brand Purchase Value Model

In detail, the conceptual definitions of all the constructs are:

Antecedents:

Perceived image is the consumer's perception of social approval and identifiableness with the brand image (brand cues including packaging design).

Emotional experience is the consumer's emotional reaction derived from direct experience with the branded product.

Perceived quality is the consumer's perception of the functional benefits and performance of the branded product.

Price acceptability is the consumer's judgment of the fairness of the branded product's price and his/ her ability to afford the price.

Mediators:

Symbolic value pertains to the way in which the consumer evaluates the product's brand name in terms of the valence assigned to the brand's reputation and its capability for self-expression.

Affective value refers to the consumer's overall feelings of the branded product.

Tradeoff value is related to how the consumer evaluates the branded product's value with economic and monetary considerations (Tsai, 2005).

Having a significant role in repeated purchasing, package design has become an important item; therefore manufacturers use vivid packaging design to make their brand more noticeable (Pieters and Warlop, 1999). So, some kind of novelty, unexpectedness, and incongruity leads to higher cognitive elaboration (Meyers-Levy and Tybout, 1989) and special displays draw attention to products and brands they prefer to sell (Allenby and Ginter, 1995). Such attempts assume that visual attention is a precondition to subsequent processes that eventually lead to choice, and that increased visual attention will increase the likelihood of choice. Despite the common assumption of a significant association, the attention-choice relationship never has been examined directly (Pieters and Warlop, 1999).

In order to assess the package, several types of tests help to make a good judgment about the design: the visibility test, evaluating the legibility of package graphics and lettering; the impact of different elements on a package, or the preference for one package over another. These tests use a tachistoscope (T-Scope), angle and blur meters, and eye movement tests (Rettie and Brewer, 2000).

There are several different types of tachistoscope (T-Scope) (Schwartz, 1975). Tachistoscopes have been used to assess pack visibility since the World War II, when it was used in training in the recognition of aircraft silhouettes (Rettie and Brewer, 2000). A T-Scope controls the length of time a stimulus package is exposed to the subject, down to fractions of a second (Schwartz, 1975). It has an electronic shutter, which allows one to control the exposure precisely. It has been used to measure the impact of the packaging, the legibility of the pack graphics, and the shelf standout of different packs (Rettie and Brewer, 2000). But now PCs, using software programs, are able to do the job of the tachistoscope.

Image tests, a second test to assess the packaging, evaluate underlying consumer attitudes toward the package and toward the product. Finally, usage tests uncover and measure functional attitudes and reactions toward the package (Schwartz, 1971). In this paper we did not go through the image and usage tests of package assessing.

3. Brain Laterality

Laterality is the preference that most humans show for one side of their body over the other. Brain laterality or hemispheric laterality refers to the asymmetry of the brain.

Although the left and right sides of the brain are physically symmetrical, they are not identical in their functions or organization. The left hemisphere processes language (Rettie and Brewer, 2000), and numerous studies have found that the right hemisphere plays a special role in processing the emotional properties of non-verbal stimuli. These studies support a model of right hemisphere specialization for emotional processing (right hemisphere model), possibly because of the greater involvement of the right hemisphere in mechanisms of automatic and behavioral arousal (Nagea and Moscovitch, 2002).

As the two sides of the brain have different specializations, there is an inherent bias in the processing of stimuli, depending on which side of the body perceived them (Rettie & Brewer, 2000). This is the reason that perception is not symmetrical. A long history of reports of right-hand side visual field superiority for letter and digit stimuli (Madden and Nebes, 1980) has demonstrated the relationship between the concept of brain laterality and the positioning and recall of pack elements.

Visual mental images can be divided into perceptual and memory images. Perceptual images arise when an object, or its reproduction, is actually present. In contrast, memory images are those of the absent object and are therefore stored as remembered perceptual images, in the absence of the object itself (Groeppe-Klein, 2003). While the effect of memory images is weaker than that of perceptual images, they can to some extent produce the same effects as perceptual images; thus, the memory images are perceived as reality. The findings suggest that both the perception of an object and the retrieval of its memory image involve the same neural processes in the brain. By this reasoning, Groeppe-Klein pointed to the relation and influence that positively toned memory images of a mall have on shopping mall assessment outside the mall, which is the same as what the perceived mall environment does when consumers are in the mall.

So as Groeppe-Klein (2003) infers about shopping malls, and according to the similarity that exists in the effect of memory image, "picture in the head" and perception of the object, we can conclude that positive memory image can influence the retrieval of the object, especially for very vivid memory images. This vividness, according to Groeppe-Klein, refers to how colorful, detailed, and varied the memory image appears to the "mind's eye." So we can consider vividness as a factor that corresponds to the information rate and the amount of subconscious processing. It also can be attributed to specialized hemispheric analyses that depend on the complexity of the information being processed (Janiszewski, 1990).

Using a newspaper format, Janiszewski (1988) found that pictorial ads were liked better when placed to the left of a certain article, whereas verbal ads were liked more when placed to the right of the material. Material in the left visual field directly engages the right hemisphere, and material in the right visual field directly engages the left hemisphere (Janiszewski, 1990). Both eyes perceive the visual area, but information from the outer right visual field initially goes only to the left hemisphere, while information from the outer left visual field initially goes directly to the right hemisphere (Rettie and Brewer, 2000). Therefore, a pictorial ad placed in the left visual field directly engages the right hemisphere. The right hemisphere provides a more accessible subconscious trace of pictorial information when a conscious evaluation is performed. Similarly, the left hemisphere provides a more

accessible subconscious trace of verbal information when a conscious evaluation is performed (Janiszewski, 1990).

In addition to the asymmetry that is in perception of different functions, there is some evidence of a gender difference. One consistent finding in the neuropsychological literature is that women are better at some verbal tasks, and that men are better at some spatial tasks. Also women tend to perform better on verbal learning and recall tasks, according to the logical memory subtest of the Wechsler Memory Scale, and list learning on the California Verbal Learning Test, and the Rey Auditory Verbal Learning Test (Ragland et al., 2000); this has been also supported by Halpern (1986).

In addition, there are some differences between right- and left-handed people. Language functions are left-hemisphere lateralized in approximately 76 percent of left-handers, 10 percent show right-hemisphere lateralization, and the remaining 14 percent show bilateral representation of language functions. There also have also been some observations that in 85–89 percent of right-handers (Welsh and Elliot, 2001), the left hemisphere contributes to the control of both hands, while the right hemisphere does not contribute to the control of the right hand. According to Welsh and Elliot (2001), 89 percent of the right-handed and 63 percent of the left-handed participants in a survey demonstrated a left hemisphere advantage in reaction time. In right-handers, the left hemisphere contributes to the reaction of both sides, while the right hemisphere does not contribute to reaction of the right side (Medland et al., 2002). It also is predicted that left-handed people would have a reversed brain division of labor.

4. Methodology

Applying the research in order to examine whether the layout of the pack elements has any effects on their memorability, we considered the factor of being on right- or left-hand side of the package. So the following hypotheses have been conducted.

H1: Pack copy will have a higher recall when it is on the right-hand side of the pack.

We know that the material in the right visual field directly engages the left hemisphere, and the left hemisphere processes language. So the left-hand side of the brain, which processes verbal stimuli, will directly receive verbal stimuli from the right-hand side of the pack. By this reasoning we want to assess whether being on right-hand side have any influence on better recall of the verbal stimuli on packages.

H2: Non-verbal material will have a higher recall when it is on the left-hand side of the pack.

This is related to pictorial or non-verbal elements of the pack. The right hemisphere plays a special role in processing the emotional properties of non-verbal stimuli. And the material in the left visual field directly engages the right hemisphere. So we can get result that the right-hand side of the brain, which processes non-verbal stimuli, will receive those stimuli directly from the left-hand side of packages and we want to examine whether being on left-hand side have any effect on better recall of the non-verbal stimuli of the packages.

This research was done randomly on 76 female and 76 male students of Azad University of Iran. The questionnaires were split equally between women and men because of brain laterality differences between genders, with women generally showing less (Rettie and Brewer, 2000). All of the participants selected were right-handed because left-handed people

tend to have different brain lateralization than right-handed people (Rettie and Brewer, 2000).

The stimuli were the elements of two sets of packages of grocery products. One of the sets included an original packages and the other one contained the same packages in which the verbal and pictorial components were reversed by Photoshop software. As shown in plate 1 and 2, each set comprised of five packages which are obvious by the name of the products. The packs in reversed set were of a high standard and not distinguishable from the originals.

We selected packages with both simple and complicated designs for our sets. We tried to select the ones which had a lower reputation in the market in order to prevent the participants from filling in the questionnaires based on their previous information.

We used the visibility test to compare the legibility and recall of "element impact" on the package to that of the others. Using computer software with better precision and visibility than tachistoscope (each pack was exposed to participants for 500 milliseconds) we compared our results to those in previous research.

As the brand cues consist of a set of verbal and nonverbal components, we selected some of the elements of each pack. We showed the same elements in both the original set and the reversed set. Each respondent saw one set of five packs, the original version (A) or the mirror version with reversed verbal and visual elements (B). An equal number of respondents saw each of the two sets. It means thirty-eight of 76 men saw version A and the remaining 38 saw version B. The same was true for 76 women; thirty-eight of women saw original version and the remaining 38 saw the reversed.

Every five packs in each set were shown for a time of 500 milliseconds. Respondents were asked to examine the packs but just look straight at the center of the pack (Rettie and Brewer, 2000). After the participants were shown each pack of a set, they were asked to fill in a section of a simple questionnaire about that pack and we tested their ability to recall the verbal and visual elements of that pack and also they were asked about the visual appeal of the package.

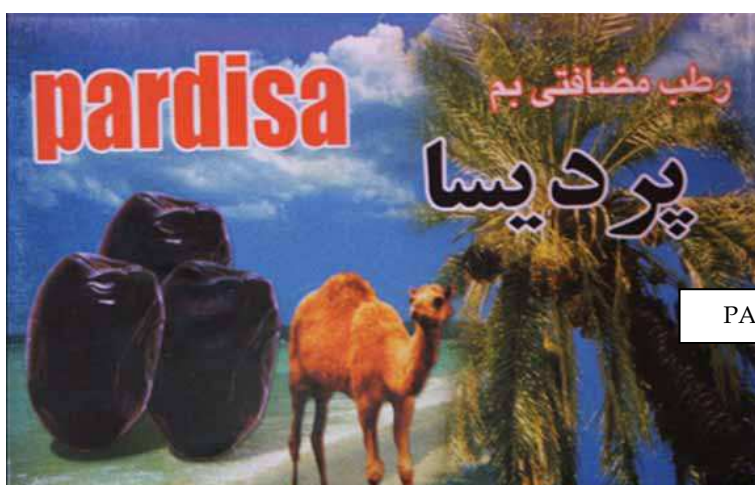
Altogether, we considered 15 recall questions from the elements of all five packs of the sets, which consisted of 8 recall questions about the verbal stimuli to evaluate H1 and 7 recall questions about the pictorial stimuli to evaluate H2.

The questions, selected elements, and the number of them for each pack differed according to their complexity and design.

For assessing our hypotheses we considered the answer of any recall question as "Yes" if the participants have been name that stimulus correctly and completely. Then we calculated the Yes answers for different categories: 1- verbal stimuli which were on right-hand side of the pack 2- verbal stimuli which were on left-hand side of the pack 3- pictorial stimuli which were on the right-hand side of the pack and 4- pictorial stimuli which were on the left-hand side of the pack.



OROUEI



PARDISA



ESHTROUDEL



CHOCO
WAFER



SEFID MORGH

Plate 1. Five packages – Original set

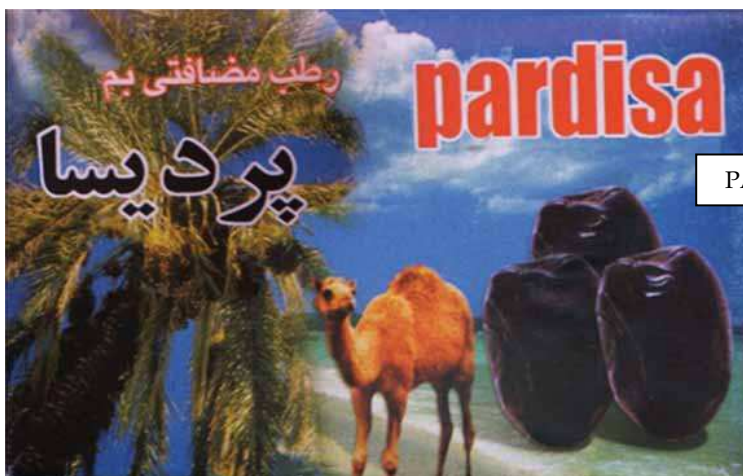




Plate 2. Five packages – Reversed set

As both dependent and independent variables, Recall (Yes/ No), Stimuli (Verbal/ Pictorial) and Position (Right/Left), were categorical, we used Chi-Square test for analyzing the answers. For the first hypothesis we collect the answers into two column; correct answers to verbal stimuli which were on right-hand side and those which were on left-hand side even in original or reversed set. And for assessing the second hypothesis, we do the same for pictorial stimuli. The results are shown in next section.

5. Findings

H1

As it is observable in Table 1, we have collected the correct answers for verbal stimuli on right- and left-hand side of the packs. Then we did the chi-square test in order to analyze the results. The amount of calculated χ^2 is 19.52, and $\chi^2_{0.05(7)}$ is equal to 14.07. Since the amount 19.52 is bigger than 14.07 we can conclude there is some dependency between the recall of verbal stimuli and their position.

With the aim of measuring the association, we used the contingency coefficient. C coefficient would be 0.18 which shows a weak coefficient. Also as we can see in the table 1, the ratio (P) of being on the right-hand side and being on the left- is very close to each other, with a small priority for copy on right. The amount of N is equal to the number of 76 participants who have seen 8 verbal elements.

Brand	Stimuli	Correct recall		Total
		F _{0i}		
		Copy on right	Copy on left	
OROUEI	ارونی	54	25	79
	میگو برگر	36	32	68
PARDISA	پردیسا	65	50	115
CHOCO WAFER	ویفر شکلاتی	49	59	108
	مغز فندق	33	31	64
ESHTROUDEL	اشترودل	20	26	46
SEFID MORGH	مجانی	33	22	55
	۱۵ تایی	39	15	54
	Total	329	260	
	N	608	608	
	P	0.54	0.43	

Table 1. Verbal stimuli recall

H2

For evaluating the pictorial elements and getting result for the second hypothesis, we prepare a table same as to verbal elements as it is shown in Table 2. The amount of calculated χ^2 for this table is 5.45 which is smaller than $\chi^2_{0.05(6)}$. So it shows that there is not any dependency between the recall of pictorial stimuli and their position.

Brand	Stimuli	Correct recall		Total
		F _{0i}		
		Picture on right	Picture on left	
OROUEI	Food in the plate	17	23	40
	Sandwich	21	20	41

PARDISA	Dates	33	43	76
CHOCO WAFER	Wafers	26	24	50
ESHTROUDEL	Food in the plate	36	25	61
SEFID MORGH	Man	53	46	99
	Egg	40	43	83
	Total	226	224	
	N	532	532	
	P	0.42	0.42	

Table 2. Pictorial Stimuli recall

6. Discussion

In this study we had eight recall questions related to verbal elements for examining H1, in which two of the stimuli, number 4 and 6, did not receive any preferences for being on right. Although 0.54 percent of the correct recalls have had the preference to be on right but the difference of this ratio with the ratio of being on left is not so much. We explain in previous section that the coefficient of the position and the verbal stimuli is just 18 percent.

On the other hand from seven recall questions related to pictorial stimuli about H2, four of the elements, number 2, 4, 5 and 6, did not have any favorite for being on the left-hand side. This means that from the correct recalls on the left (224), 48 percent were more easily recalled than those on the right. So in total 532 observations, about 20 percent of answers have supported H2. These evidences show that we can not expand the outcomes to all the cases and the results of prior studies for left-to-right languages such as English might not be valid for right-to-left languages.

It is obvious that considering the only factor of position would not be enough. There are many factors such as the background color, font color, accompany with other elements, being on top, bottom or center and etc. which get involved in pack design and do influence the memorability of elements and the retrieval. Thus they should be taken into account in order to obtain proper conclusion.

One of the important items we met was the existence of an association of stimuli. Rettie and Brewer (2000) described this as a “flash”. For instance we can consider a group of verbal and pictorial elements as well as a numerical element, altogether as one united stimulus. Can we select a part of whole pack and consider pictorial elements such as the man and egg with the verbal stimuli of “١٥ تالبي” in one set, as one element? This is a question that needs further studies to answer.



Plate 3. A flash stimulus

About numerical elements, we had one recall questions that examined best positioning of numbers; we categorized it as verbal stimuli and it supported our hypothesis of better retrieval on the right-hand side of the pack as H1 (Table 3). Of course one element is not enough to obtain the results. Should they be considered as verbal or pictorial stimuli? Or they might have their own characteristics.

Brand	Stimuli	Correct recall		Total
		Flash		
		Copy on right	Copy on left	
SEFID MORGH	۱۵ تایی	39	15	54

Table 3. Numerical stimuli recall

7. Limitations and further research

As we mentioned before, some limitations affected the result of this survey. One of them was related to packages; having a small numbers of packages to evaluate was a source of bias because it was difficult to find packages with the appropriate positioning of verbal and pictorial elements by which the reversed version could be strikingly different and suitable for assessing our hypotheses. Also we had to consider that the stimuli had to be of a nearly same size. Incidentally, for further research the need to consider more packages from other fields in addition to groceries, could bring more insights into this subject.

Another bias that we faced while collecting the data was that some participants already were familiar with the packages, so they completed the questionnaires on the basis of previous information. We tried to select packages that were not popular in the market. Although we did not have many of such respondents, this bias could be considered in future researches. Of course, for surveys with more packages and more participants, it would be a serious limitation that should be avoided.

The lack of packages with flash elements prevented us from being able to study more complicated positioning. Also the effects of other factors such as color, font size or the position of being on the center of a pack were not considered in this survey. And also because of having just one numerical element we were not able to study on these elements precisely.

For this reasons we suggest future researchers to use the artificial packages, designed by the research group, in order to control all of the factors precisely and so avoid these kind of limitation. They could control the positioning of the elements, flashes, their colors, and font size in order to measure the effects of different factors individually or in combination with each other. The familiarity of participants with packages then will cease to be a problem. In this way flashes also, as unique elements, can be studied more.

This promises valuable results as memory researchers have devised a large number of tasks in which subjects are presented with a cue and required to recall an item associated with it (Lockhart, 2000).

8. Managerial implications

Given that packaging is considered as a point-of-purchase advertising vehicle, so pack design is of a high value for marketers. One of the factors of pack effectiveness is the consumers' ability to retrieve brands and identify products in busy perceptual fields. In this situation the design of the pack itself may be an incentive to buy. Considering package design as an ad, and that a positive effect is transferred from ad to brand, led to the conclusion that ad likeability results in brand likeability. Making a brand strongly in customers' minds with very positive and relevant association leads to more sales as the perceived image of a brand name is one of the most effective factors that results in repurchase.

So one of the targets is making the brand name more self-expressive and according to the existence of brain laterality, we should remember the factors that affect this. The position of the elements is one of the factors that stem from this issue. There are many researches show that to recall some elements of the pack better, we should pay attention to the position of the elements as well as the aesthetic parameters of the pack. These researches which have done for left-to-right languages show verbal elements of pack are better recall on the right side and pictorial elements on the left side.

By these explanations the magnitude of pack design which is related to specific characteristics of target market is clear. The main point is that investment in design which is better matched to the anticipated target market will avoid either under- or over spending. Language differences are one of the factors which vary in different market and may affect consumer information processing. These effects are not only in terms of mental representation, but also in the way they are organized and retrieved from memory.

Since many of the world's countries mainly in Asia, Middle East and Africa have written languages with the right-to-left structure specially Arabic and Persian, this issue has a great importance. According to OIC (organization of the islamic conference) the population of Islamic countries is about 1.5 billion. Considering the 6.6 billion world's population, a market size of 22 percent has a worth of great marketing research. Some of these countries like Malaysia, Turkey, Indonesia, UAE, Saudi Arabia, Iran, Nigeria, Egypt, Algeria, Pakistan, Iraq, Morocco, Kazakhstan, Bangladesh, Tunisia and Kuwait are notable markets. According to ITC (international trade center) countries such as Turkey, Malaysia and United Arab Emirates have in order 138, 131 and 110 billion dollars import and the other above countries with a range of about 70 to 10 billion dollars import amount are judged as significant markets.

The results of our study in right-to-left languages showed the factor of position according to brain laterality should be taken into account for verbal elements. Elements such as brand name, some promotions or some benefits conveyed in an ad, which are important to retrieve, would be more advantageous if being on the right side in order to arouse higher recall.

But for pictorial elements we were not successful to prove the assumption that being on the left side leads to higher retrieval. So for positioning the pictorial materials of packs we have more choices in the layout, even as an association with other parts especially verbal elements.

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From 3rd to 5th March 2008 the International Association of Technology, Education and Development organised its International Technology, Education and Development Conference in Valencia, Spain. Over a hundred papers were presented by participants from a great variety of countries. Summarising, this book provides a kaleidoscopic view of work that is done, all over the world in (higher) education, characterised by the key words 'Education' and 'Development'. I wish the reader an enlightening experience.

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