



Evaluation of the experiential levels of CPGs (Consumer Packaged Goods) using 3D modelling

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Abstract

The design of packaging is a determining factor when choosing consumer packaged goods, particularly those considered to be impulse purchase products. In these cases it is useful to have a precise idea of which is the most suitable design for the image and values that the brands aim to convey.

Most of the research conducted in this field focuses on the sensorial aspects transmitted by packaging without delving into the experiences associated with the perception or consumption of the product.

The investigation presented in this article aims to analyse the influence of the form and colour of the packaging on the perception of potential consumers. For this purpose a questionnaire was designed with 29 areas that analyse both sensorial and experiential levels, relating them to the predisposition to buy a product.

Some 400 people were interviewed and presented with 9 different proposals for chewing gum packaging. The designs were devised through combining three different forms and colours that were rendered through 3D modelling.

1 Introduction

In 2009 over 19.000 new consumer packaged goods (CPGs) were launched worldwide. Such fierce competition among CPGs brands has led companies to adopt packaging designs with communication strategies that are increasingly innovative and surprising. This is why the value brands place on product image through packaging has become a key element in differentiating products and in forming their image of quality.

Packaging design brings together beauty, creativity, inventiveness and technology. Moreover, it is an interdisciplinary task. Yet how much do feelings and associated experiences come into play when we choose a product? Up to what point do we allow ourselves to be enticed by visual appeal?

Brands are so concerned with the appearance of their products that packaging is being re-designed in ever-shorter timespans in order to increase their power of persuasion and to obtain visibility on the most important display shelves. Similarly, examples can often be found of products with seasonal packaging, or limited edition products with packaging created by upmarket designers.

Model 1. Evian limited editions designed by Jean Paul Gaultier and Issey Miyake

In these examples the product packaging becomes almost as well-known as the contents. As George[1] (2005) states, 'in some areas the packaging is the same as the product'.

The communication of CPGs must be attractive and effective enough to hold the consumer's attention. Therefore, interest in the communication strategies used in product packaging is evinced in several research projects dealing with various aspects of the communication of packaging design. Back in the 1950s, Banks, S. [2] (1950) studied 'The measurement of the effect of a new packaging material upon preference and sales', suggesting how these aspects could influence consumer purchasing choices. Likewise, Pieters and Warlop[3] (1999) make reference to the examination of visual attention during brand choice.

Other research has focused on analysing the influence exerted by elements in the packaging communication, such as the attentional effects of incorporating a picture or illustration of the product on the packaging of the product [4] (Underwood et al., 2001); brand image perceived by the consumer [5] (Ribeiro et al., 2008); studies measuring the impact of relative package appearance on consumer attention, categorisation and evaluation [6] (Garber et al., 2000; [7] Plasschaert, 1995; [8] Schoorsman et al., 1997);



the influence of package shape and colour on consumer expectations [9] (Ares and Deliza, 2009); packaging size and shape [10] (Wansink, 1996); research measuring the impact of package size on consumer usage [11] (Raghubir, P. and Greenleaf, E.A., 2006); studies of the communicative role of packaging [12] (Nancarrow et al., 1998); the relationships between products and sensory analysis and packaging attributes [13] (J.M. Murray, C.M. Delahunty, 2000). They found that descriptive analysis could successfully characterise and discriminate between products on the basis of the attributes of their packaging. Bo Rundh[14] (2009) points out the factors that affect different actors with respect to the packaging design process and also suggests a design process model.

All this research has contributed important data on very specific communicative aspects in the perception of products and the influence of their shapes, colours, label imagery, material perception, etc. However, none of these studies takes an overall view of the various experiential levels of the product perceived through packaging design, and how to obtain a packaging design that most closely reflects a product's attributes and the experiential levels that a brand wishes to transmit. The experiential level of a product is understood as the experience associated with how it is perceived during and after consumption.

The way for a product to arouse interest is linked to a set of expectations, desires and experiences that the consumer perceives through the design. In this case, the aim is for the product to provide higher levels of satisfaction. Thanks to their packaging, CPGs have become catalysts for new experiences, sensations and emotions. The product is much more than its contents and becomes what it is able to make you feel and experience[15] (Serrano, 2009 et al.).

In some categories, such as chewing gum and sweets, unplanned purchases may reach 85% [16] (Meyer, 1988). We therefore decided to focus our research on the perception of the experiential levels of a product with a high probability of impulse buying: chewing gum. Our study was based on a detailed analysis on the way men and women perceive different experiential levels for three different designs of chewing gum packaging. These three designs were rendered in 3D and each given three colour variations – graduated cool colours (green/blue), graduated warm colours (yellow/red), and a scale of greys (light grey/black) – making a total of different nine models.

Since what the consumer perceives through product packaging does not always match the attributes that brands aim to communicate, this research aimed to devise a simple and useful methodology for marketing departments and designers which gives information on potential consumers' evaluation of product packaging designs.

To find out the relationship between design elements and the experiential perception of products, we devised a four-stage methodology in order to obtain the **Knowledge of the Experiential Levels of the Product (KELP)** as perceived by consumers: 1 - the design of a product attributes test carried out by a panel of experts and including various experiential levels. 2 - the rendering of packaging alternatives for use by design teams and brand marketing departments so that they are effective when choosing the most suitable design alternative. 3 - the assessment of alternatives by a sample of potential product users/consumers. 4 - an analysis of the results obtained.

The participation of users/consumers in some decision-making processes in product design is becoming increasingly popular. Why not therefore allow end

consumers to have a say in packaging design and evaluate the experiential association perceived through different design proposals? The data obtained would provide the brand with key information.

1.1. Frame of reference

Strong competition between CPGs brands means packaging design is being studied more and more, leading to design proposals that awaken the senses, stir emotions and new experiences when consuming the product. This strategic positioning comes from experiential marketing [17](Lenderman, 2008), proposing a type of message that is more relevant and memorable, as it appeals to consumers', users' or customers' emotional sides, and is able to generate new experiences for them. This idea of providing experiences is applied from the promotion of the product through advertising, to the moment of buying and consuming the product, thanks to its packaging. The aim is to give consumers an "extra" experience, which is memorable and seeks to ensure brand loyalty. A product's added value is the experience that it is able to transmit.

Yet how are product characteristics linked to this experience? And how does the experiential level relate to the consumption conditions of the product? Product, advertising and packaging generate a single message based on a specific experience which aims to endure beyond the moment of purchase and consumption of the product or service. Advertising also plays an important role as it must reinforce the associated experience.

In this case, the approach to packaging design must encompass and reflect the way of perceiving these experiences associated with consumption as clearly as possible. How can we decide which type of experience is most suitable for a specific segment of consumers? In order to find out the true perception of consumers, research must be conducted to find out how a specific consumption situation can be enriched, and which design elements effectively link the consumption of a product to a specific experience.

For this investigation, a list of 13 attributes was drawn up. These were taken from various chewing gum advertising campaigns in direct competition with each other. The aim was to discover how the packaging and colour variables conditioned the types of sensations and experiences associated with the nine models in order to determine the packaging model that brings the most intense experiential levels together. The list of 13 attributes was chosen by a committee of experts by analysing different chewing gum advertising campaigns and was drawn from a preliminary list of 26 attributes.

Naturally, not all consumers are equally sensitive to certain stimuli, but the task was to find those capable of arousing similar experiential levels among the highest number of potential consumers. Product aesthetics would therefore be key. Another issue to be examined was whether there was a type of experience that fits in better with a specific product. The success factor and anything to do with hedonism and pleasure would be experiential levels that could easily fit in with a large number of CPGs. Other experiential levels, such as those linked to sex and attraction, are also easy to associate with specific products. Some products try to take those experiences to maximum levels.

Today, experiential levels linked to caring for the environment are having a strong impact on consumers. Veri is one of the brands using recycled PET for all its 1.5 litre containers. Each bottle of water uses 25% PET. This

is substantially reducing the company's environmental footprint by lessening the consumption of non-renewable resources, minimising waste and reducing CO₂ emissions. A growing number of consumers are sensitive to this type of positioning and there is a clear experience associated with caring for the environment.



Model 2. 1.5 litre bottles of Veri water

The use of experiential levels on a product through packaging design will enable deeper interaction between the brand and consumer, providing the latter with much more than a product. Thus, a transformation in the way certain products are consumed can be observed.

If packaging designers are aware of these resources when making designs, they can set up a new dialogue with the consumer, who will take away a new relationship with the product and enjoy it more. Enhancing experiential levels associated with product consumption creates a new horizon for experiences, which is definitely steering pioneering brands towards a new type of differentiation for their products. Yet again, packaging design shows that they are receptive of the most innovative trends in design by introducing new values in the design of their products. Naturally, some types of products are more susceptible to impulse buying than others. This is why the importance of the "experience" level in the decision to purchase is increasing, since there are more brands opting to use these strategies of attraction. Thus, brand positioning sets the tone for the message sent out by the product. From then on, the designer must be able to assimilate this positioning to effectively reflect the chosen strategy through design.

Several examples are given below of products in which the strength of these lures rests on enhancing new experiences associated with their consumption and which, until only a short time ago, used a much lower level of interaction with the consumer. The more consumers feel the strength of the experience promoted by the product, the more vulnerable they are to its attractive effect.

Products with a high experiential level:

The packaging of the Kandoo brand offers a new way of consuming. Going beyond its function as a container, the games box design of the packaging acts as a catalyst to transform the experience of using it into something more fun. Its bright, contrasting colours and rounded shape invite children to use the wipes with the same smile and spirit as displayed by the Kandoo mascot.



Model 3. Kandoo wipes

Combining different levels of the icon register, such as photographs with drawings, has renewed the language of graphics used in the packaging design of this lemonade bottle. Added to this is the sense of humour which describes a truly refreshing experience.



Model 4. Minute Maid Lemonade

Alessi was one of the designers chosen to contribute to the design of CPGs with a high emotive content, proposing a carefree product, very different from the usual presentation formats. Proposing experiences of use that are fun and where the action is carried out by the container, is undoubtedly a complete novelty.



Model 5. Bref WC, designed by Alessi

Products with a medium experiential level:

Many products are attractive to consumers because they communicate their benefits through visual metaphors relating the consumption of the product with experiences of personal care and well-being, such as the following examples:



**Models 6, 7 and 8
Scottex toilet roll, Vivesoy pineapple and soya drink, and Carrefour creamy yoghurt**

Low experiential level:

As mentioned earlier, some consumers are not susceptible to being lured by this type of experiential resource because their needs focus on finding the most competitive price. Generally, hard discount or own brand products opt to leave the experiential levels in the background.



**Models 9, 10 and 11
Auchan brand "best buy" ground coffee, Carrefour anchovies and Auchan brand "best buy" hazelnuts**

2 Methodology

The methodology proposed is detailed below. It aims to find out the perception of the experiential levels of a sample of potential consumers shown new virtual designs for chewing gum packaging.

1st stage: Preliminary design of the text in relation to the attributes that the brand wishes to transmit, to be completed by a sample of consumers. In this case, as we were seeking to determine the experiential association present in the nine models suggested, the list of attributes did not match a previous strategy set out by a company. The list of 13 attributes was selected by a committee of experts from a preliminary list of 26.

2nd stage: 3D modelling of the design, using software (3D Studio Max, in this case) of the alternative designs to be evaluated. Three of the nine different formats for chewing gum were chosen at this stage. Of the three formats (blister pack, paper-wrapped tablets and slim pack), one was a recently launched, more innovative format. Each format was rendered in cool and warm colours, and a scale of greys.

3rd stage: Evaluating the test on a significant number of potential product consumers. Some 390 secondary, sixth-form and university students (190 girls and 200 boys) aged between 16 and 23 took part in the study. The nine design alternatives were presented to each student, printed on plastic-coated A3 paper, together with the experiential level test. Each student was given approximately 12 minutes to complete the test. Those taking part in the survey were told that they had to fill in the score for each design spontaneously. On finishing the test, each participant was given a packet of chewing gum to say thank you, (courtesy of Wrigley Spain).

Before the test, the participating centres carried out a preliminary test on ten subjects in order to determine the time needed to complete the 13 questions and to understand the attributes to be analysed.

4th stage: Data analysis and decision making. The design of the test with the 13 experiential attributes and the willingness to buy to be evaluated, together with the nine designs proposed for chewing gum packaging was presented (fig.1).

These are the 13 experiential attributes to be evaluated: healthy, dynamic, sophisticated, fun, explosive, sensual, elegant, mysterious, successful, innovative, wild, attractive and rebellious.

3 Results

The Individual differences model [18, 19] (Horan, 1969; Carroll & Chang, 1970) was used to analyse the data obtained. This model is used to find out the similarities or dissimilarities between a set of stimuli (nine chewing gum packet designs, in this case) and a set of attributes, and to analyse the preferences of the subjects surveyed. This method, also called INDSCAL, is based on multidimensional scaling [20] (Schiffman et al. 1981). It allows the creation of a consensus space showing the dissimilarities among the packs of chewing gum when chosen by individuals (in this case the differences in the two dimensions vary between -1,5 and +1,5), and it shows the weighting that each individual gave to the

dimensions obtained in the consensus space. The weightings reflect the importance that individuals attach to the dimensions of the stimulus space. While one person may perceive one of the dimensions as being more important than another, another person may have the opposite response.

Euclidean distance was chosen as the measure of similarity, and S-Stress as the adjustment and dimensioning measurement.

The vector model [21] (Davison, 1984) was used to interpret the dimensions of preference in each attribute evaluated. This model helps to interpret the dimensions of the space of similarities using the attributes making up the similarities between the stimuli. In addition, the attribute-vector is displayed as a line in the space representing the chewing gum packs on which the projection of each stimulus corresponds with the degree of attributes possessed by the stimulus. If the attribute in question is strongly related to the stimulus space, then the stimulus projections will coincide very closely with the attribute value and the correlation between the projection and the attribute value will be quite high. When two attributes lie in the same direction, this also indicates a high correlation between the two. This model allowed the chewing gum packs to be ordered in each of the attributes evaluated by the subjects. It also made it possible to determine which attributes present a high correlation in the evaluation of the stimuli. Information was also included on individuals' willingness to buy. The data was processed using SPSS (version 18).

It can be seen how the analysis of attributes relating to the experiential level transmitted by the nine packaging designs for chewing gum shows a difference in the two dimensions (fig.2). The adjustment measure is 0.08. Dimension 1 is defined by attributes referring to bold experiences, very often found in adolescent attitudes (fun, dynamic, attractive, rebellious, mysterious), whereas dimension 2 is defined by attributes relating to innovative experiences (innovative, sophisticated), less in tune with the lifestyles of young people. The attribute "elegant" relates to both dimensions equally. Dimension 1 differentiates designs by colour and dimension 2 by shape. Design 8 was seen as daring and innovative; on the other hand, design 1 received the lowest scores in these attributes. An analysis of the weightings of each individual shows that most of them value dimension 1 more highly (51.9%), and 8.1% prefer dimension 2. Some 40% gave similar scores to both dimensions.

For the attributes in dimension 1, warm colours are closely related to an impression of youth, while the scale of greys relate to the experiential levels of elegant and mysterious (fig. 2).

Regarding dimension 2, the slim pack format relates most closely to innovation.

In relation to willingness to buy (fig. 3), willingness to buy shares characteristics with both dimensions, although it is more closely related to dimension 1.

If the projections of the designs are made on the direction indicated by willingness to buy (Figure 3), it can be seen that the order of preference is 8, 9, 5, 7, 6, 4, 2, 3, 1. Additionally this figure shows that colour is a component that exerts greater force and is more influential than the shape of the packaging.

The most highly rated packaging was model 8, as it includes warm colours and the packet was seen as the most innovative.

Design proposals evaluated

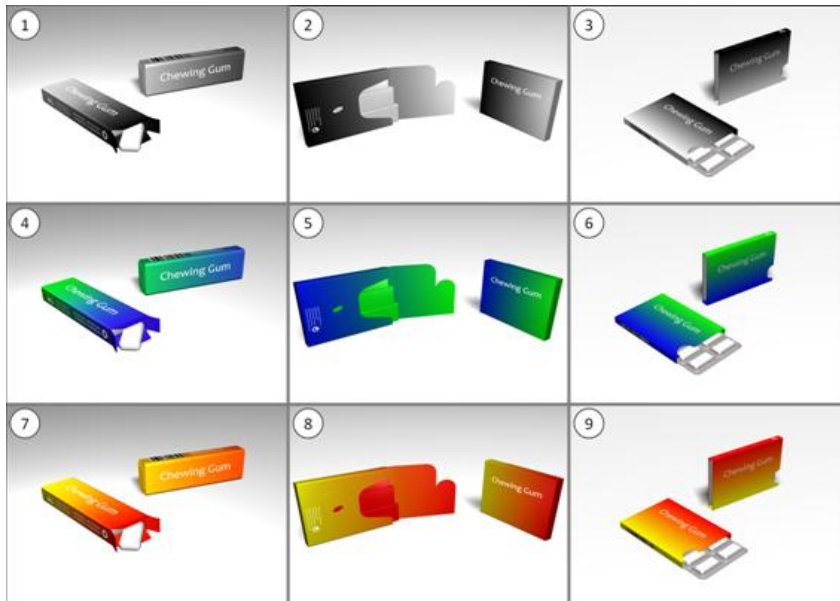


Fig. 1 Proposals evaluated

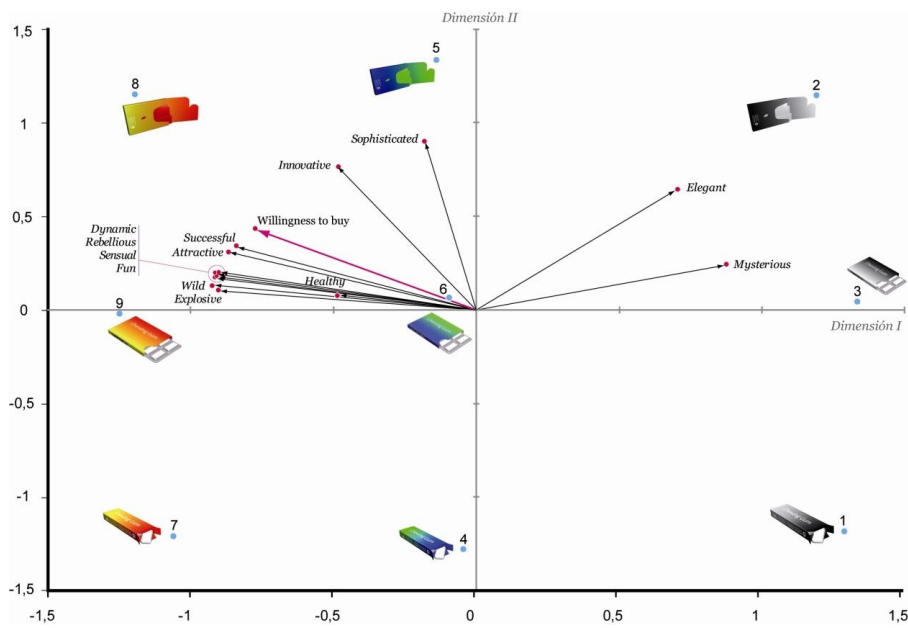


Fig. 2 Results

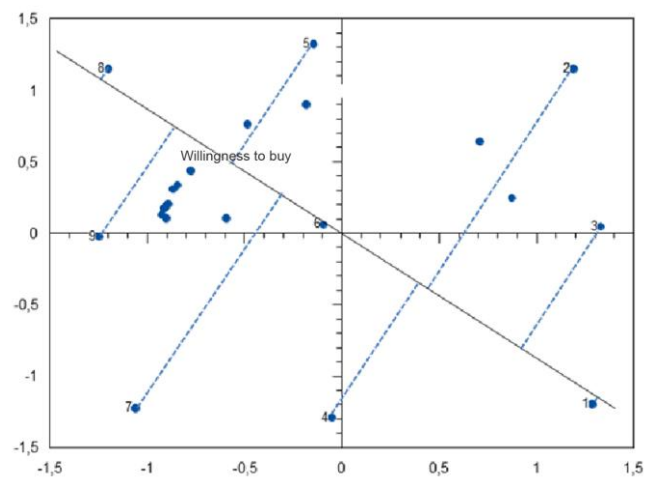


Fig. 3 Willingness to buy

4 Conclusion

Strong competition among CPG brands has led companies to adopt packaging designs with communication strategies that are increasingly innovative and surprising. This means that the value brands place on product image through packaging has become a key factor in differentiating products and their image of quality. Because of heavy competition among brands, the packaging designs of CPGs require much effort from interdisciplinary work teams consisting of designers and marketing experts.

Simple methods involving virtual 3D-modelled packaging prototypes for use by marketing departments and design teams, and the participation of users/consumers in evaluating design alternatives are an opportunity to find out users' perceptions of different alternatives, thus obtaining a higher success rate in the final product launch.

The search for new experiential values associated with product consumption transmitted through packaging design provides a differentiating element which, if used effectively, will position brands at the forefront.

Warm colours are closely related to an impression of youth and are linked to experiences seen as positive among adolescents, relating to things that are fun, dynamic, attractive, wild, rebellious and explosive. On the other hand, shades of grey relate to experiential levels of elegance and mystery.

Providing new approaches to packaging design gives a more innovative character to products and product consumption. This shows the importance of visual impact, since in many cases a new packaging design can be the deciding factor in product purchase.

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