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How consumers estimate the size and appeal of flexible packaging

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ABSTRACT

The use of flexible packaging by fast moving consumer goods industry is on the increase due to price affordability of the packaging material and logistic benefits when compared to rigid packaging. This work investigated the influence of flexible packaging dimensions and product weight on the size impression and aesthetic appeal of pre-packaged powdered products. Powdered products of different sachet dimensions and product weights were prepared and ranked by panelists based on the quantity of powder contained in the sachet. The appeal of sectional shapes of the sachets used in packaging of the powder was also evaluated using a 9-point semantic scale. Obtained data were subjected to multiple paired comparison, correlation, regression and agglomerative hierarchical clustering analysis. A 27 g powder packed in a sachet having an area of 8640 mm^2 was perceived to be bigger ($P < 0.0001$) than the 30 g powder packed in a sachet having an area of 10,560 mm^2. The result indicated that the size impression and appeal of powdered products in flexible sachets is greatly influenced by the ratio of sachet area-to-powder weight (A:W).

Introduction

Great importance is placed on packaging (Danger, 1987), especially in its ability to inform and persuade consumers (Gautier, 1996). Packaging communicates brand personality through many elements, which include a combination of brand logo, colours, package materials, fonts, pictorials, product descriptions, shapes and other elements that provide rich brand relationships (Underwood, 2003). Visual package elements play a major role, representing the product for many consumers (Silayoi & Speece, 2004). Although the nutritional aspects of consumer goods are critical to food and nutrition security (Enujiugha & Ayodele-Oni, 2003), it is the aesthetic and appeal properties, as well as the unit price, that influence the buyer's perception and eventual decision at the point of purchase.

In today's competitive environment, one of the key challenges faced by packaging technologists, designers, and marketers is to maximise the size impression of their products to the consumers. Certain package shapes might represent a double-win situation; that is, they may be more likely to be chosen because they are perceived to be bigger, and in that form, they also may be consumed faster (Raghubir & Krishna, 1999). Chandon and Ordabayeva (2008) observed that changes in size appear smaller when products change in all dimensions (height, width, and length) than when they change in only one dimension. In a study by Wansink and Van Ittersum (2003), children and adults pour and consume more juice when given a short, wide glass compared to those given a tall, slender glass, but they perceive the opposite to be true. Changes in dimension of flexible packaging can lead to a change in size impression by consumers. If the consumers perceive a reduction in the size impression they will be expecting a discount on the product – and the marketer must be ready to offer this discount in order not to lose market share.

Since many consumers do not read volume information on the packaging (Dickson & Alan, 1986), packages that appear larger will be more likely to be purchased. This makes this particular study of high significance to help understand the variables that may be involved in the perception of size variability by consumers. Small size packaging of consumer goods is a common feature in rural markets in the less-developed areas of the world. Many of these small size packaging are made from flexible materials. These flexible packaging options offer great advantages compared to rigid packaging such as rigid plastics and metals. Flexible packaging has lower weight and this can translate to cost savings on packaging material, space optimisation and material transport. Smaller packages usually appear to be bargained at lower prices (although promotion is a major contributor to this trend) and this makes the product readily affordable to a greater percentage of the population compared to larger packages. The understanding of consumers' affective responses to sectional shapes of products packed in flexible sachets is also of key importance in driving sales of products.

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The affective engineering approach was employed in this study to investigate the packaging appeal of powdered products packed in flexible sachet. Affective engineering is concerned with measuring people's affective responses to products, identifying the properties of the products to which they are responding, and then using the information to design better products (Chen, Shao, Barnes, Childs, & Henson, 2009). This methodology has been employed to measure and test differentiation between competing products.

As competition in the market becomes tougher, the need to design products that will not only meet the consumers' functional requirements, but also their emotional requirements, is important in differentiating a product in the market. Thus consumer goods manufacturers formulate strategies to include consumers' perceptions and emotions into product development (Chen et al., 2009). The consequence of this approach is that a packaging design methodology being driven by consumer needs is the heart of modern design practices in industries and other design institutes. Hence, the need to involve the consumers in the early stages of product design cannot be underscored (Kaulio, 1998). This study investigates the effect of flexible sachet dimension and product weight on size impression of small size packaging (23–30 g) of a powdered product. It also investigates the appeal of sectional shapes of sachets and its relationship with sachet dimension.

Materials and methods

Subjects

Thirty-one panelists (21 males and 10 females) between the ages of 18–45 years participated in the evaluation. Participants attended the session singly or in pairs. Same set of panelists were used to evaluate the three groups (A, B and C) of sachets.

Samples

Prototype samples of the powdered product (bulk density = 400 g/m^3) packed in sachets were prepared. Sachets were made from 37 micron flexible plastic film. The prototype samples were in 3 groups (A, B and C).

The sachets were packed in strips, with each strip consisting of six sachets. The sachets had pillow shape. The group A sachets' dimension was based on constant length, varied weight and varied height. Sachets in group A were designed to determine if variations in the sachet height and product weight would result in differences in size perception by consumers. The group B sachets' dimension was based on constant weight, varied height and varied length. Sachets in group B were designed to determine if variation in the height and length of sachets would result in differences in size perception by consumers. These dimensions were obtained from different sachets of the powdered product (23–30 g) available in the Nigerian market. The dimensions used in group C were determined after analysing the dimension of a corpus of 23–30 g competing products available in Nigerian market. The group C sachets all contain same powder weight of 30 g. The dimensions for the group C sachets were: 96 mm (length) × 95 mm (height), 96 mm × 115 mm, 87 mm × 115 mm, 110 mm × 95 mm, 87 mm × 125 mm, 110 mm × 125 mm. Samples in group C were scored based on the appeal of the sectional shapes of the sachets.

Procedures

The sachets were labelled with random numbers and hanged on a rope as obtained in local retail stores. Participants were asked to rank the groups A and B sachets on the basis of the quantity of powder they contain. The group C sachets were designed to check if variation in sachet dimensions will influence the appeal rating of the packaged powders. Samples in group A were ranked by panelists from 1 to 8; with 1 being the sachet perceived to have the smallest quantity of powder and 8 being the sachet perceived to have the biggest quantity of powder. Samples in group B were ranked by panelists from 1 to 5; with 1 being the sachet perceived to have the smallest quantity of powder and 5 being the sachet perceived to have the biggest quantity of powder. The term biggest refers to the sachet with the highest quantity of powder. The order of presentation of the sachets was randomised. Two techniques were adopted in the ranking of the sachets in groups A and B. The first technique was based on appearance of the sachets without touching them (vision). The second technique was the use of the combination of both touch (hand-feel) and appearance (this combination represents how they would feel the product if they were to purchase it in the local retail stores) to assess the size of the packs.

The scoring of the group C sachets for the appeal of sectional shape was done using a 9-point scale; with 1 = extremely like and 9 = extremely dislike. Rank data obtained from groups A and B were analysed using the "Kruskal Wallis" rank test. The means were separated using the multiple comparison test – "Steel–Dwass–Critchlow-Fligner" procedure ($P < 0.0001$). To further understand the relationship between the panelists' ranking and physical parameters of the packs; the ranking results were subjected to multiple linear regression analysis – MLR ($P < 0.05$). Parameters used in the MLR were: rank score, powder weight, sachet length, sachet height, A:W (ratio of sachet area to powder weight), sachet (front panel) area, and sachet (front panel) perimeter.

The appeal scores of the sectional shape of the group C sachets were also subjected to analysis of variance (ANOVA) to test for significance. Agglomerative hierarchical clustering (AHC) was used to separate the consumers into groups. Correlation analysis of the sachet parameters was done using Microsoft Excel 2007. The other data were analysed using XLSTAT version 2010.3.06.

Results

The mean of ranks for the eight sachet types in Group A based on appearance are shown in Table 1. The data indicated that there were significant differences (df = 7, K (observed value) = 104.83, K (critical value) = 14.07, $P < 0.0001$) between sachets.

The 23 g sachet with an area of 10,560 mm^2 was ranked the smallest of all the samples.

Panelists ranked the 27 and 30 g powders packed in the small (lower sachet area) sachets bigger than those packed in big (higher sachet area) sachets (Table 1). Provided that sachet dimensions were kept constant, the panelists could not differentiate between a 27 and 30 g powder. Also panelists could not distinguish the difference between a 23 g pack and 25 g pack in sachets with small areas. The 27 g powder packed in a sachet having an area of 8640 mm^2 was ranked higher ($P < 0.0001$) than the 30 g powder packed in a sachet having an area of 10,560 mm^2.

The mean of ranks of Group A sachets based on the combination of appearance and touch is shown in Table 1. The result obtained from ranking based on the combination of the sense of touch and sight was almost similar to that based on sight only (df = 7, K (observed value) = 112.22, K (critical value) = 14.07, $P < 0.0001$) except for some few differences. No difference ($P > 0.0001$) in size was observed for the 30 g powder packed in the 10,560 mm^2 and 9120 mm^2. The 27 g along with the 23 g powders packed in the big sachets were ranked smaller than those packed in the small size sachets (Table 1).