The Influence of Color and Shape of Package Design on Consumer Preference: The Case of Orange Juice

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Abstract: Building on existing research regarding product packaging and the factors that have the most notable influence on buying preference, pricing and other elements of bottled orange juice, this study expands understanding of how two key factors, color and shape, build synergy and influence consumer attention and ultimately their purchasing choices. This research used three field studies to isolate and test the effect of color and shape on the product’s perceived quality, consumer’s preference and pricing. The results presented here, and the consequent discussion may provide useful insight for design and marketing managers when setting prices and selecting packaging color and shape for creating synergy and augmenting quality perception and buying preference.

Keywords: Bottled orange juice packaging, Color, Shape/quality perception, Price perceptions

1. Introduction

Packaging, as a research topic, has received increased focus over the last decade, and is now regarded as an essential factor driving consumer behavior and decision-making processes, especially at point-of-sale (Kuvykaite, Dovaliene, & Navickiene, 2009). It is now understood that a product’s design and presentation can be the determining factors for its success or failure in the marketplace (Berkowitz, 1987). A product’s packaging not only provides protection for its physical content, but also serves as an interface between the customer and the brand (Rod, 1990), transmitting conceptual and sensory information that adds up to its perceived value, thus making it a powerful communication and branding tool (Ruth & Carol, 2000). These perceived characteristics, especially in food products, are often associated with the product’s overall quality, creating and reshaping expectations and customer satisfaction over time (Pinya & Mark, 2007). Previous research has suggested that packaging can greatly affect a brand’s perceived meaning (Underwood, 2003), and that if thoughtfully designed, it can be an effective tool for establishing and conveying brand identity and brand values (J. Schoormans, den Berge, van de Laar, & van den Berg-Weitzel, 2010).

Orange juice packaging has not been the subject of an extended field study. Gadioli, De Oliveira, Quintiliano, Bezerra, Queiroz and Chiarello (2012) worked on communicational aspects of orange juice packaging and corresponding intention to purchase. Vila & Ampuero (2007) worked on the graphic elements of packaging and its function in positioning.

With a fresh focus on two aesthetics factors of packaging, color and shape, this research seeks to answer the question: How do cap color and bottle shape influence preference among orange juice consumers?
For this research, four colors were used. The cap color was selected avowing those of leading brands, to ensure an unbiased perspective from participants. Three standard bottles were selected with shapes sufficiently distinctive from those of the leading brands to avoid bias and singular enough for participants to perceive difference. Based on the assumption that the preferred cap color and bottle shape are the best combination for positively impacting consumer choice, that combination is expected to see better performance in the consumer choice tests. Previous research has shown that the white color carries inherent positive perceptions of purity, so this is the basis for H4. For the bottles, it is expected that a more curved or anthropomorphic shape will see better performance, due to the association with human forms.

Anthropomorphism is the integration of human-like shapes into nonhuman objects (Puzakova, Kwak, & Rocereto, 2013). Humanizing packaging generates a more favorable consumer attitude and brand image (Aggarwal & McGill, 2012). Prior research has examined the effect of anthropomorphizing products in general; however, this research focuses on how anthropomorphizing the package shape, and not the product itself, can influence the consumer purchasing decision. The following hypotheses are suggested:

**H1.** The color of the cap for bottled orange juice has a significant influence on consumer choice, with white bottle caps recording the most positive influence compared to blue, black and red caps.

**H2.** The shape of the bottle has significant influence on consumer choice, with anthropomorphic bottles having the most positive influence compared to round or square shaped bottles.

**H3.** A combination including the preferred shape and preferred color has the highest impact on consumer choice.

**H4.** An orange juice bottle is perceived as being of higher quality when presented with a white cap, as compared to bottles with blue, black or red caps.

**H5.** Anthropomorphic bottles are perceived as being of higher quality compared to bottles with rounded or squared shapes.

**2. Literature Review**

**2.1 Color and shape, key dimensions of packaging design**

Research from Westerman et al. (2013), examined how package design affects consumer assessment by manipulating fundamental graphical forms, such as shape, orientation and alignment. Determining the preference for color and shape when creating a desired aesthetic however, remains a challenge for professionals in different research fields. Besides selecting each individual characteristic, the challenge is to combine them into a desirable and interesting product. By merging different design elements in a synergic manner, it is possible to generate a stronger effect than that from the individual, separate elements. Despite widespread interest in this topic, few professionals have studied the role of color in marketing (Labrecque & Milne, 2012).

Marketing experts now recognize that color plays an important role in increasing sales, but most have no clear understanding of how to develop positive color associations for their products (Grossman & Wisenblit, 1999). For example, the color red has been associated with excitement (Naz & Epps, 2004) (Hemphill, 1996) and an affinity for Chinese, Korean, Japanese or American cultural icons (Grossman & Wisenblit, 1999). Moreover, it can be used to symbolize danger or compliance. In contrast, blue is often used to represent openness and peaceful imagery (Mehta & Zhu, 2009). When considering emotional responses, bright colors often elicit positive associations, while dark colors produce primarily negative associations (Hemphill, 1996). Black, for example, evokes negative emotions such as sadness, depression, fear and anger mainly because it is also associated with the concept of death (Naz & Epps, 2004). At the other end of the spectrum, bright colors such as red, orange and yellow may cause euphoric states, when
used under certain circumstances, in part due to their higher wavelength (Jacobs & Hustmyer Jr, 1974). Among different perceptions, red has been shown to produce feelings of warmth and intimacy, while some other hues have been deemed irritating. Research suggests that integrating shape and color elements into the package’s design can influence consumers’ perception of quality and their emotional responses and general preferences. The orange juice industry typically utilizes nature-evoking colors like orange, yellow or green for their caps.

The interest in Packaging over the years, has yielded two distinct lines of thought regarding its role. One approach views the design value of a package as the sum of all of its individual elements (colors, images, shapes, typefaces and size) (Pinya Silayoi & Speece, 2007). The other school of thought argues that packaging is often perceived by the customer as a holistic design element, one that must be assessed as a whole (Orth & Malkewitz, 2008). However defined, the package and its color can be of great value when trying to differentiate a brand (Garber Jr, Burke, & Jones, 2000), especially if the brand seeks to convey a particular message to its audience, regarding price, quality, age or gender (Klimchuk & Krasovec, 2013). By itself, color has been proven to drive consumer behavior due to associative learning. People often make connections between colors and their perceived meanings, which then generate associations over time (Kreitler & Kreitler, 1972); studying and understanding these connections allows designers to shape those associations (Lee & Barnes, 1989).

Packaging shape, specifically for bottles, has been seen to have an effect on brand perception among customers (Parise & Spence, 2012), given it can communicate a product’s apparent advantages and disadvantages. Additionally, customers tend to judge volume and determine product convenience based on sight or touch, especially in food packaging, all of which helps to set color, shape and size as key dimensions of package design.

The present research examines the impact of shape and color on orange juice consumer preference.

2.2 The combined effect of shape and color
The congruence of stimuli regarding shape and color (e.g. high potency angled shape and high potency red color), has been seen to mediate product evaluation and attribute perception by facilitating its processing (Van Rompay & Pruyn, 2011). Processing fluency does not present a cognitive challenge and so it can generate aesthetic pleasure and other positive effects; fluent stimuli is perceived as more appealing than non-fluent or incongruent stimuli (Reber, Schwarz, & Winkielman, 2004).

Otherwise incongruent combinations of stimuli (e.g. high potency or angular shape with low potency or less saturated color) are often perceived as lacking a clear product identity, negatively affecting product evaluation. Consequently, shape and color, as isolated elements, are used to induce specific taste perceptions or evaluations of food products. Yet, it is the union of the two that ultimately has the strongest effect on a product’s overall image, rather than individual specifics (Becker, Van Rompay, Schifferstein, & Galetzka, 2011). On the other hand, Ares & Deliza (2010) argue that consumers tend to appraise color and shape independently and their interactions are not relevant to the consumer’s response to and willingness to purchase a given product. Another approach suggests that the combination of both elements has an observable effect on consumer perception but is subject to their sensitivity to design (Bloch, Brunel, & Arnold, 2003; Smets & Overbeeke, 1995).

The present study seeks to demonstrate the combined effect of a combination of the preferred color and shape is the most influential.
2.3 Packaging and consumer choice
Packaging at point-of-sale is the last chance a producer has to sway the customer towards their product, and its impact is so significant that it has become known as the “silent salesman” (Koutsimanis, Getter, Behe, Harte, & Almenar, 2012; McDaniel & Baker, 1977; Sara, 1990). When the product’s intrinsic values cannot be assessed before purchase, packaging serves as an extrinsic attribute for customer evaluation (Zeithaml, 1988). Aesthetically attractive package design has been seen to activate affective areas of the brain, prompting emotional responses that influence choice (Reimann, Zaichkowsky, Neuhaus, Bender, & Weber, 2010). These emotional responses redirect the customer’s attention, influencing his decision-making in the process (Öhman, Flykt, & Esteves, 2001). Furthermore, the sensory stimuli contained on the package helps to distract customers from shopping routines, capturing their attention through novelty and mediating for product categorization (Garber, 1995).

2.4 Packaging and perceived quality
Perceived quality can be defined as the overarching judgment formed by the consumer when estimating a product’s excellence or its advantages versus others (Anselmsson, Johansson, & Persson, 2007). Visual cues contained on the package (Ampuero & Vila, 2006) help consumers assess the product’s quality by evaluating its physical attributes (Sehrawet & Kundu, 2007). Responses achieved through perception, concerning packaging and its design cues, are known to influence consumers assessments of food products, and in doing so, to aid brand-preference building by improving overall estimation of quality for both the product and the brand (Edward, 2013).

By isolating shape and color design elements, it is possible to analyze the likelihood of each to improve the product’s perceived quality. Hence, the objective is to explain the influence that perceived quality has on buying preference.

2.5 Packaging and the price of the product
Building on the premise that consumer preference is shaped through the influence of design on perception of quality, the next step is to identify the limit up to which the customer is willing to pay for said preference and whether price affects quality perception. When consumers have a wide range of options in terms of value propositions, only products that can distinguish themselves from average commodities are able to capture the benefits of aesthetics and design. A survey of Tai consumers on packaged food products reported that 84% of those surveyed were willing to pay up to 10% more for nicer packaging (Speece, 2003). More research is needed to determine the effects of additional increased pricing.

Consumers process all visual elements through central and peripheral routes (Homer, 2006). According to the dual-process theory of persuasion, superficial elements that are linked to the attractiveness of the visual proposition are processed through the peripheral route, while the central route processes visual data based on rational arguments and responses based on judgments involving quality evaluations (Petty & Cacioppo, 1986). In previous research on the effects of package design on price expectation, Orth, Campana, & Malkewitz, (2010) observed that certain inherent cues on the package generated price expectations directly and indirectly based on assessments of their quality and attractiveness. These formed expectations are seen to affect consumer’s intentions, even when price information is not available (Jun, MacInnis, & Park, 2005). Price expectations might be higher for harmonious and rich designs given their association with higher quality. The design’s attractiveness may also impact price expectation, due to natural and refined factors.

Research shows that consumers tend to perceive attractive packages as having higher quality than less attractive packages (Orth et al., 2010). The design and color of a product also indicate the demographic at which it is targeted and may also be an indicator of price range. High priced products tend to have darker colors while more affordable products lean towards lighter tones.
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(Ampuero & Vila, 2006). Additionally, the shape of the packaging has been shown to affect volume perception, with, for example, elongated shapes being perceived as offering a better value for their price (Pinya Silayoi & Speece, 2007).

Research has frequently suggested that a congruent mix of design elements, including shape, can generate a higher perceived value for the product and the brand. With a higher perceived value, come higher expectations for price and other aspects (Erdem & Swait, 1998, 2004). The present study analyzes the effect of price on a tested shape and color combination by comparing different packaging arrangements, one with the preferred color and shape, the other with the least selected combination.

3. Research Methodology

3.1 Study 1 experiment: Colour caps

In study 1, the experiment consisted of presenting four bottles of orange juice to sample subjects, all with the same cylindrical shape (round) and with no labels or brands (see Photo 1). A set of four colored caps were matched to each bottle, with blue, white, black and red as selected colors for the test. The price and content of the bottles were set equally. All participants were informed about these conditions and instructed to choose the one they preferred.

Photo 1: Bottles with different colour caps tested

The cap color was selected according to explained considerations. The bottle shape was consistent with market standards.

3.2 Study 2 experiment: Shapes

The participants were presented with three variously shaped bottles, rounded, squared and anthropomorphic, each containing an identical volume of juice. White caps were used on all bottles to control for variable of color, as white ranked first (50.9%) in study 1 for consumer preference. Participants were required to base their choice only on the bottle’s shape.
The rounded shape was selected for use in the study because it is the most common shape for beverages containers in household market, but not frequently used for orange juice. The squared shape was selected to be more of a novelty, as it is used by just a few natural drink brands, and no water brands are currently using it. The anthropomorphic was selected as a reference for distinctive packaging as it is very similar to that of Coca-Cola.

In the current orange juice market, several competitors employ at least one of the three shapes used in study 2. Though they are not used by any of the predominant competitors, anthropomorphic bottles are currently used by some brands for some of their products, while squared shapes, especially for larger containers (more than 1 liter) are preferred by the majority. Other natural products, like Aloe Vera juices, are use squared shapes as well. Only a few brands use rounded bottles, even though it is a fairly familiar shape for the orange juice product category.

3.3 Study 3 experiment: Two bottles and price
For this study, only two bottle arrangements were used: an anthropomorphic bottle with a white cap and a square bottle with a black cap. The anthropomorphic bottle and white cap arrangement was selected because it was a combination of the highest ranked for preferences for both color and shape. The squared bottle and black cap were the lowest ranked.

Participants were asked to choose between two bottles, in four sets of bottles separated by cells. The first cell had both items priced equally (control), the second had the anthropomorphic-white combination priced 5% higher than the square-black combination, the third 10% higher, and the fourth 20% higher. (See photo #3). The 135 respondents were distributed by arrangement among the cells, with 31-40 subjects per cell.
4. Data Analysis and Interpretation

4.1 Study 1 results: Color caps (Choice)
The white cap bottle registered the highest preference, at 50.9%, followed by blue and red, at 20% each. The bottle fitted with the black cap was the least preferred, at 9.1%. Results are presented in Table 1.

Table 1: Summary table for study 1 results.

| Cap   | % Choice | Quality (1-7) |
|-------|----------|---------------|
| Blue cap | 20       | 4.23          |
| White cap | 50.9     | 4.7           |
| Black cap | 9.1      | 2.9           |
| Red cap | 20       | 4.12          |

Figure 1: Graphic representation of cap color selection.

Source: Elaborated by author. 55 participants.
4.2 Study 2 results: Bottle shapes (Choice)
The anthropomorphic bottle ranked first for preference, at 43.1%, followed by the rounded bottle, at 29.2%, and the squared bottle, at 27.7%. The selection frequency and perceived quality for each shape can be found on Table 2.

Table 2: Preferred shape, perceived quality and choice probability for orange juice bottles.

| Shape             | Frequency | Percentage | Quality | T-statistic | Significance |
|-------------------|-----------|------------|---------|-------------|--------------|
| Anthropomorphic   | 28        | 43.1       | 5.20    | 21.3        | 0.000        |
| Round bottle      | 19        | 29.2       | 5.19    | 26.5        | 0.000        |
| Square bottle     | 18        | 27.7       | 5.03    | 24.4        | 0.000        |
| Total             | 65        | 100.0      |         |             |              |

Quality: Despite being the highest ranked for preference by a significant margin, the anthropomorphic bottle was perceived as having only slightly increased quality, rated at 5.20. The rounded bottle followed at 5.19, and the squared received a rating of 5.03. The distribution was normal. A t-test indicated the difference is statistically significant.

4.3 Study 3 results: Two bottles and price
Contrary to expectations, the squared bottle with a black cap outperformed the anthropomorphic bottle with a white cap (60.6% versus 39.4%) in reported preference in the first control cell (equally priced price). As the price range increased, the preference for anthropomorphic-white decreased further. Study results, including price ranges are presented on the Table 3.

Table 3: Bottle selection at different price levels.

| Bottle Type          | 0% | 5% | 10% | 20% |
|----------------------|----|----|-----|-----|
| Anthropomorphic bottle – White cap | 39.4 | 37.5 | 35.5 | 29.0 |
| Square bottle – Black cap | 60.6 | 62.5 | 58.1 | 71.0 |
| DN/DA                |    |    |     | 6.5 |

Figure 2: Graphic representation of bottle selection at different price levels.

Figure 3: Graphic representation of quality perception at different price levels.
The perceived quality of the squared-black option was significantly higher in the control group and increased during the difference price tests. The anthropomorphic-white option did not show any changing patterns in relation to the variation in prices (Figure 3).

In order to evaluate significant differences between the anthropomorphic-blue and the squared-red arrangements, a t-test was performed, showing statistical significance with 99% C.L in all cases. Another t-test (for related samples) was performed to evaluate the statistical difference in quality perception between 10% (5.3) and 20% (5.4), finding no significant results.

Table 4: Quality perception at different price levels.

|                | 0%     | 5%     | 10%     | 20%     |
|----------------|--------|--------|---------|---------|
| Antropomorphic bottle – White cap | 5.37*** | 5.48*** | 5.32*** | 5.42*** |
| Square bottle – Black cap          | 5.40    | 5.80    | 5.81    | 5.88    |

***: Significant difference at 99% CL

Table 5 presents the binary logistic regression performed to predict the effects of quality on the preference of bottle. The choice of bottle was selected as the dependent variable and the quality perceptions for the anthropomorphic-white and square-black bottles were included as independent variables. A significant correlation, 0.477**, between the perception of the quality of the black capped bottle and the bottle of choice was seen.

This was confirmed by the high correlation between the bottle of choice and the perceptions of quality of the square-black bottle. This result was consistent at all price levels. On the other hand, the anthropomorphic-white bottle only achieved significance for the 20% price gap. This indicates that a quality factor began to influence respondents choice at a 20% price increase.

Table 5: Binary logistic regression results at different price levels.

|            | B    | S.E.  | Wald | gl  | Sig.  | Exp(B) |
|------------|------|-------|------|-----|-------|--------|
| 0%         |      |       |      |     |       |        |
| Antropomorphic – White cap | -     | 2.259 | 6.170| 1   | 0.013 | 0.104  |
| Square bottle – Black cap   | 1.128 | 0.718 | 2.470| 1   | 0.116 | 3.089  |
| Constant                            | 7.055 | 4.973 | 2.013| 1   | 0.156 | 1158.406|
| 5%          |      |       |      |     |       |        |
| Antropomorphic – White cap | -     | 1.126 | 2.802| 1   | 0.094 | 0.324  |
| Square bottle – Black cap          | 1.817 | 0.654 | 8.196| 1   | 0.004 | 6.496  |
4.4 Discussion: Study 1, 2 and 3

The results of Study 1 seem to support H1 (Consumers tend to prefer bottles with white caps over red, blue and black ones). Moreover, the highest-ranking color was white, preferred by over 50% of participants.

As a controlled variable, the price was the same for all bottles in study 1. In reality, products with outstanding added values can support an increased price according to their brand’s equity. The premium price, on its own might, be the best available way to measure brand equity (Aaker, 1996). Therefore, additional research is needed to determine if the preference for white caps is supported when the price variable increases and also up to what point the price can be raised without overbalancing the perceived added value pushing the consumer towards a different choice. Is a 5% increment enough to sway consumers, or is the preference strong enough to allow an even larger gap? Second, while color clearly influences preference, the cause of the influence is unclear. What takes place in the consumer’s mind that makes them choose a specific color over others? The answer might lie in the field of emotions.

Results seems to suggest that when consumers are presented with a choice and not enough information to assess it, they might be inclined to choose the better-known option, in this case, the white colored cap, based on its place as a socially familiar cue of clarity, nature and purity. Color cues have been instinctively used by humans to determine safety and danger throughout history, and multiple studies have observed the impact color has on consumer preference, particularly in relation to edible goods (Williams, 1992).

The purpose of study 2 was to evaluate the influence of shape on preference and perceived quality. The anthropomorphic bottle was the highest ranked shape among the presented options, with 43.1% of preference.

At this point, it can be said that both color and shape have a major impact on consumer preference for bottled orange juice, and these factors offer orange juice manufacturers an additional way to add value to their products. Based on results from studies 1 and 2, a squared bottle with a black cap is the least appealing combination for orange juice.

The results from study 3 were unexpected, but they add important perspectives to the study. It was demonstrated that the combination of design elements can indeed create new synergies that outweigh the individual elements studied before. The squared-black option was used only in the last study. Additionally, results suggest that that price itself does not add enough perceived quality to the Orange Juice to make it a preferred choice.
4.5 General discussion

H1 (The color of the cap of the orange juice bottle has significant influence on choice, with the color white having the most positive influence, as compared to blue, black, and red) was confirmed, since it was proven that cap color had a measurable effect on buying decision. White caps were initially selected as the preferred cap by participants, but in other conditions, black was preferred. Synergy perceived by the consumer explains why the round – black combination was the least attractive and still, the squared – black combination had a high preference compared. Although color has a real importance, it is not possible to predict color influence without having clear the shape where it is applied.

H2 (The shape of the orange juice bottle has significant influence on choice with anthropomorphic bottle, having the most positive influence compared to round or square bottle shapes) was also partially confirmed since it was proven that container shape has a strong influence on preference, still the most effective shape depends on the synergy created by the shape and its color. Both the anthropomorphic and the squared bottle shapes had a good acceptance in different conditions. Squared-black was preferred over anthropomorphic-blue and that one was then preferred over squared-white. Again, synergy can create new and different results with pre-tested colors and shapes.

H3 (The combination of preferred shape and preferred color is the best possible arrangement in order to attain consumer’s choice) was not confirmed because a combination of less preferred individual elements became a better arrangement than the combination of preferred cap and preferred bottle shape. This result supports the idea that the synergetic combination of design elements can generate a better effect than a simple combination of design elements (Labrecque & Milne, 2012).

The study found that H4 (The perception of quality for bottled orange juice was significantly higher for bottles with white cap compared to bottles with blue, black or red colored caps) does not apply to Orange Juice products. Evidence suggests that additional factors might be needed to explain the influence that cap color has on perceived quality.

H5 was not born out as initially conceived. For orange juice packaging, diverse factors influence perceived quality, and the anthropomorphic shape did not significantly increase perceived quality. (The perception of quality was significantly higher for anthropomorphic bottle compared to bottles with round or square shape). Both squared and anthropomorphic bottles were viewed to be of similar quality.

Having congruency between shape and color makes their processing easier (Van Rompay & Pruyn, 2011) and more aesthetically pleasant, while at the same time presenting less cognitive challenge to the consumer (Reber et al., 2004). This study found that such congruency or synergy can be generated for the consumer through other resources than the preference for individual elements. Memories or secondary associations might be involved, in much the same way that design sensibility affects a person’s perception of shape and color (Bloch, Brunel & Arnold, 2003). It is not possible to predict consumer congruency between shape and color through the preference of any of these elements individually.

Another element that was analyzed was price. Consumers are less inclined to choose higher priced products unless they are perceived to have sufficient added value. This was replicated successfully although a frustration variable, which was also found among the consumers who chose a lower price when the other option increased in; the anthropomorphic-white option’s perceived value did go up, but not enough to make it the preferred option.
5. Contributions and Recommendations

5.1 Future Research
This research added new perspectives for understanding the phenomenon of the effect of color and shape on packaging. Some remaining questions for future discussion are listed below:

- How can the design of orange juice packaging help generate sufficient perceived quality to justify a higher price, if cap color and shape are not sufficient?
- What mechanisms are used by consumers to generate congruence between color and shape in bottled orange juice packaging?
- Besides color and shape, what elements aid in building perceived quality in bottled orange juice package design? How are these elements interrelated?

5.2 Managerial contributions
The results from this research suggest that cap color and bottle shape cannot be considered as secondary elements for packaging design or product marketing. The use color and shape can have a great impact on product attractiveness for store brands, and packaging may carry more weight than the brand itself. Those brands that promote an intensive use of corporate colors on their packaging must pay attention to the color and container shape affect that communication. The color-shape synergy on the package must hold beyond a given preference for their individual elements.

The perceived increase in quality that comes with a higher price is not enough of an argument to increase buying preference. Managers who want to use price as a selling argument need to support it with additional elements of perceived quality. This research has the potential to expand towards examining the effects of different cultural backgrounds. Cultural influences on color and shape perception may be relevant to the study’s results.

Innovation might play an important role in the color-shape proposal, as elements of little separate importance are combined to create new and powerful synergies.

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