Symmetry and Attention in a Retail Context

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Abstract:
This paper investigates the impact on visual attention of a symmetrical versus an asymmetrical arrangement on the front of pack (FOP) of FMCGs. The authors conducted a laboratory experiment using an eye-tracking method. Two FOPs were designed for each product category (orange juice, chocolate bars, pasta and biscuits). In one version the information items were arranged symmetrically around a vertical axis, and in another they were asymmetrically arranged. The findings show that symmetry influences viewers' attention, first by influencing the visual attention paid to the entire FOP and, second, by its impact on the capacity of specific FOP areas to capture and hold visual attention.

Keywords: Front of pack, symmetry, visual attention, eye tracking.

1. Introduction

"Symmetry is an important and prominent feature of the visual world." (Bertamini et al., 2018, p. 1). "Symmetry is everywhere: in natural objects, from crystals to living organisms, in manufactured articles of many kinds, and in art works from all cultures throughout the world and at all times" (Wagemans, 1995, p.9). Symmetry is also a characteristic of front of pack (FOP) information on fast-moving consumer goods (FMCGs), with supermarket shelves displaying both symmetric and asymmetric designs within the same product category. However, research on symmetry in marketing is rare and very few studies have assessed the impact of symmetry, with the exceptions of Creusen et al. (2010) in the context of product design and Bajaj and Bond (2018) in brand perception. Creusen and Schoormans (2005, p.68) distinguished six different roles of product appearance for consumers: communication of aesthetic, symbolic, functional product information, ergonomic product information, attention drawing and categorization. They highlighted the importance of attention-drawing from the product's appearance, noting that: "Gaining attention is an important first step in enabling consumer product purchase […]. When a product stands out visually from competitive products, chances are higher that consumers will pay attention to the product in a purchase situation, as it 'catches their eye'." Löfgren et al. (2008) also emphasised the fact that product package aspects (such as design) help the product to capture customer attention in what they call the "first moment of truth", i.e., product choice at point of purchase. The influence of a product's design on visual attention has thus been noted by several scholars. However, no study as yet has specifically investigated the influence of symmetry on visual attention. The present study therefore looks at two issues: (1) transferring the notion of symmetry to the field of product packaging and (2) investigating the impact of symmetry on visual attention using an eye-tracking method.

2. Conceptual Background and Hypotheses

The graphic rearrangement to convert a non-symmetric picture into a symmetric one simplifies the stimulus and the ease with which it is understood by facilitating visual exploration behaviour. This cognitive facilitation induced by reducing visual complexity leads to a lower level of visual attention (Nucci and Wagemans, 2007). So, we propose:

H1. Symmetric FOP will receive less attention than asymmetric FOP.

When viewing symmetric stimuli, individuals tend to look first at the centre of the form (Kootstra *et al.*, 2008) or the pattern's "centre-of-gravity" (Richards and Kaufman, 1969). More recently, Brouwer *et al*. (2009) showed that when observers look at simple geometric shapes (a square or a triangle), they tend to direct the first saccade towards the "centre of gravity". Kootstra *et al.* (2011) also observed that early fixations are on the centre of symmetrical images, both for simple artificial geometric stimuli and complex photographic images of natural (flowers) and man-made scenes (buildings, landscapes). So, we propose:

H2. Areas close to the centre of the FOP will attract visual attention more quickly for a symmetric FOP than for an asymmetric FOP.

Observers can detect this axis from a large range of stimuli very rapidly (Locher and Nodine, 1987) and with little or no effort (Barlow and Reeves, 1979) compared to asymmetric forms. Using paintings and artwork as stimuli (Locher and Nodine, 1987), and more recently clouds of dots (Meso et al., 2016), researchers have shown that individuals tend to look first at the areas close to the vertical axis of symmetry. So, we propose:

H3. Areas close to the vertical axis of the FOP will attract visual attention more quickly for a symmetric FOP than for an asymmetric FOP.

Locher and Nodine (1987) observed a concentration of visual fixations along the axis in images containing a single axis of symmetry, whereas visual fixations were more spread out for non-symmetric images. Similarly, Kootstra et al. (2008) showed that individuals had a strong tendency to focus their attention on the elements close to an axis of symmetry when looking at a complex symmetric image like a flower. Moreover, Meso et al., (2016) also highlighted the strong salience of the symmetry axis; they demonstrated that gaze locations were aligned along the axis of symmetry and that fixations kept the fovea close to the symmetry axis. So, we propose:

H4. An FOP area located around the vertical axis will receive more attention for a symmetric FOP than for an asymmetric FOP.

3. Methodology

We conducted an eye-tracking laboratory experiment. Orange juice, chocolate bars, pasta and biscuits were used as the stimuli. To avoid familiarity bias, the authors selected two brand names in each category that were previously unknown to participants, either because they had not been marketed in the country in which the study was conducted or because they were fictitious: *Tropsun* and *Valleys* (orange juice), *Montego* and *Hershey* (chocolate bars), *Granvois* and *Bellange* (biscuits), and *Cipriani* and *Miracoli* (pasta). For each brand, a professional designer created a symmetric and an asymmetric version of the FOP. All of the FOPs displayed eleven information items selected from the most frequently displayed items in a real-life situation for the four product categories. Information items were symmetrically arranged around the vertical axis for the symmetric FOP version, and asymmetrically for the asymmetric FOP. Likewise, the constitutive elements of the image (quarters of an orange, squares of chocolate, spaghetti, and biscuits) were arranged in a symmetrical way for symmetric FOP and in an asymmetric way for an asymmetric FOP. Several presentation sets were designed for the experiment. For each product category, the participants were shown a set of two FOPs positioned next to one another, with one brand FOP displaying a symmetrical design and another brand FOP an asymmetrical one; thus, two different brands were presented in each set. In this within subject-design, each participant had to be exposed to both experimental conditions (symmetry versus asymmetry) without being exposed to the same brand twice. The presentation order of product category and brand name within the same product categories, as well the position of the symmetric FOP (left or right), were randomized across participants. In total each participant was exposed to four sets, one set per product category.

The sample consisted of 46 participants (30 women), aged 19 to 57 (M = 28.96; SD = 12.114). Each participant was welcomed at the laboratory by an experimenter. For each product category, the participants were shown a set of two FOPs positioned next to one another, with one brand FOP displaying a symmetrical design and the other an asymmetrical one (within subject design). They were told that they would be shown several sets of product packages, with two product packages in each set, and that their task was to choose one of the two product packages for each product category. The participants were seated facing a 22” (48.7 cm x 27.4 cm) Dell screen, in front of which a binocular remote corneal reflection eye-tracking system had been installed (SMI RED 250). Exposure time was free, and participants could move on to the next set by pressing the keyboard space bar after having orally stated the product chosen. Once participants had seen the four sets, they answered questions about their age, gender and visual acuity.

Previous research conducted in commercial marketing (e.g., Adil, Lacoste-Badie, Droulers, 2018) or social marketing (e.g., Lacoste, Minvielle, Droulers, 2019) context has shown eye-tracking systems to be a valuable measure of attention. To measure attention devoted to an area of interest (AOI), we used three eye-tracking measure: 'entry time', 'fixation time' and 'fixation count'. To measure how attention was distributed across the FOPs during the experiment, we created five areas of interest: entire FOP, FOP centre, area along the vertical axis, left side of the FOP and right side of the FOP.

4. Results

The results revealed that participants spent longer looking at asymmetric FOPs than symmetric FOPs (M_{SYM} = 6501ms (SD = 3564), M_{ASYM} = 6901ms (SD = 3861), t (45) = -2.17, p = .035). They also made more fixations on asymmetric versus symmetric FOPs, although the statistical significance of this result was only marginal (M_{SYM} = 26.3 (SD = 13.03), M_{ASYM} = 27.3 (SD = 13.46), t (45) = -1.79, p = .080). Thus, hypothesis 1 is partially supported.

The time to first fixation (entry time) on the area close to the centre of the FOPs was shorter in symmetric versus asymmetric FOPs ($M_{SYM\ EntryTime}$ = 3125ms (SD = 2692), $M_{ASYM\ EntryTime}$ = 4178ms (SD = 3507), t (45) = -2.33, p = .024). The time to first fixation (entry time) on the area close to the vertical axis of the FOPs was shorter in symmetric versus asymmetric FOPs ($M_{SYM\ EntryTime}$ = 1160ms (SD = 838), $M_{ASYM\ EntryTime}$ = 1810ms (SD = 1558), t (45) = -2.52, p = .015). Therefore, hypotheses 2 and 3 are supported.

The results showed that participants spent longer looking at the area close to the vertical axis for symmetric versus asymmetric FOPs (M_{SYM} = 1919ms (SD = 1123), M_{ASYM} = 1416ms (SD = 831), t (45) = -6.41, p = .000) and made more fixations for symmetric versus asymmetric FOPs at the area close to the vertical axis (M_{SYM} = 8.4 (SD = 4.58), M_{ASYM} = 6.3 (SD = 3.46), t (45) = -6.25, p = .000). Therefore, hypothesis 4 is supported.

5. Discussion

The findings show that in the case of a symmetric FOP, some areas act as early attention attractors, such as the centre of a symmetrical product package and the area close to the vertical axis of symmetry. Moreover, the present study also shows that fixation durations are shorter for symmetric FOPs. It is possible that participants pay less attention to symmetric versus asymmetric FOPs because of the redundancy and regularity of elements displayed on each side of the vertical axis of symmetry. In this study, the findings that symmetric FOPs received less attention could be interpreted as a potential issue for FMCG manufacturers in a real-world setting. However, psychology studies have shown that symmetry leads to less complexity (Berlyne, 1971) and more perceptual fluency (Reber *et al.*, 2004). Therefore, the lower level of complexity generated by a symmetric FOP could lead to greater perceptual fluency and improved evaluation, as there is broad consensus in the psychology literature that perceptual fluency has a positive influence on aesthetic evaluation (Schwarz, 2004).

It also means that, since participants pay less attention to symmetrical (vs asymmetrical) FOPs, and because the two areas of symmetrical FOP (centre of the package and close to the vertical axis) capture and hold attention more than asymmetrical FOP, a manufacturer choosing a symmetrical FOP should be aware that information placed outside these two specific areas will not be looked at very much.

Finally, the findings of this study are useful for designers, marketers and retailers as the visual attention given to specific information can be increased at no additional cost through a more appropriate arrangement of the information items.

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