



Packaging design as an implicit communicator: Effects on product quality inferences in the presence of explicit quality cues



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ABSTRACT

In this work we examine the interactive effect of packaging design and explicit packaging cues on quality inferences. Although the effect of explicit cues on product perception has been studied extensively, systematic research on this topic is still in its infancy. Furthermore, it has never been investigated whether design cues and explicit cues interact with each other in eliciting product inferences. Gaining knowledge about these effects is important, because in real-life situations consumers are predominantly exposed to product packaging that contains both subtle and explicit cues. In this work we examine how value – a dimension of colour that is related to “darker” versus “lighter” colours – affects product inferences. Two studies demonstrate that consumers use value as a cue to make product quality related inferences. Furthermore, we examine how consumers make product quality inferences when packaging design cues are congruent and incongruent with explicit quality cues. Based on Cue Consistency Theory (Maheswaran & Chaiken, 1991; Miyazaki, Grewal, & Goodstein, 2005) and information diagnosticity, we predicted that packaging design cues only affect quality inferences when they are congruent with explicit cues. Contrary to Cue Consistency Theory, results indicate that overall, packaging design affects quality inferences independently from explicit attribute cues. They emphasize the communicative power of packaging design, and value in particular.

1. Introduction

A growing body of research demonstrates that consumers are unconsciously influenced by subtle cues in store environments. Although research has extensively addressed the effects of retail atmospherics such as scents, displays and sounds on consumer behaviour (Turley & Milliman, 2000), the effect of packaging design on consumer behaviour has only recently started to receive substantial attention. This is striking, as brands are able to reach consumers through product packaging when the iron is hot – at the point of sale. Furthermore, packaging design contributes to brand identity and brand equity, especially for low involvement, nondurable products such as food (Underwood, 2003).

A number of recent studies suggest how isolated packaging cues affect perceptions and expectations of several product attributes, such as effects of packaging colour and value on quality (e.g., Ampuero & Vila, 2006), packaging shape on flavour (e.g., Becker, van Rompay, Schifferstein, & Galetzka, 2011), and packaging shape on healthiness inferences (Van Ooijen, Fransen, Verlegh, & Smit, 2017). However, there is a lack of studies that examine how subtle packaging

design cues, such as value, and shape, affect behaviour when other (explicit) informational cues, such as claims, price or brand, are also available. Gaining knowledge about the effects of packaging design in the presence of explicit attribute cues is important though, as such combinations of cues represent real-life purchase situations. That is, at the point-of-purchase, consumers are likely to base their decisions on explicit cues, such as price and claims, as well as subtle cues that are communicated by packaging design, such as colour, graphic design, and shape. The aim of this study is therefore to shed light on the interactive effects of packaging design and explicit cues, and how congruence (versus incongruence) of these cues influences consumer decision-making.

In the present study, we thus investigate 1) to what extent design cues are effective in influencing product quality inferences, and 2) how design cues affect quality inferences when explicit cues are available. In a series of experiments, we first replicate and extend former studies suggesting that a specific dimension of colour –value, determining the darkness or lightness of a colour –affects quality related inferences of food products. Secondly, we extend present knowledge by examining how value of packaging affects quality inferences in the presence of

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congruent and incongruent explicit quality cues: price and brand information. To further improve the practical relevance of the studies, we create a comparative processing context, in which participants are presented with multiple product packages at the same time (Newman, Howlett, & Burton, 2016). By addressing the effects of both packaging design and explicit cues, and doing so in a comparative processing context, we significantly contribute to the limited knowledge that is available on how packaging design affects consumer behaviour.

2. Conceptual background

In the purchase process of low-involvement products such as food, consumers typically use easy-to-process cues to make inferences about product attributes (e.g., Steenkamp, 1990). Explicit cues such as price (Mitra, 1995; Shiv, Carmon, & Ariely, 2005), nutrition labels (Roberto et al., 2012), country of origin (Chao, 1998; Verlegh & Steenkamp, 1999) claims (Lähteenmäki et al., 2010; Van Ooijen, Franssen, Verlegh, & Smit, 2016), and logos (Steenhuis et al., 2010) have typically been studied as cues that consumers perceive as diagnostic when assessing product attributes. In the past 20 years however, a growing body of research has paid attention to the communicative character of product design and its role in perception of product or brand characteristics. In fact, subtle design cues such as shape and colour affect product inferences and may influence consumer behaviour accordingly.

2.1. Implicit versus explicit packaging cues

As argued by Karjalainen (2007), design cues are implicit to the extent that they are often not recognized deliberately, but ‘make sense’ to consumers when they are used in the correct manner. Design cues distinguish themselves from explicit cues that have typically been studied as persuasive cues (e.g., price, claims, or brand), because they may not be consciously perceived as cues that communicate brand characteristics in a persuasive manner.

Although consumers may be consciously aware of both explicit packaging cues and design cues (i.e., they are both visually perceivable), they may still lack awareness with regards to the persuasive effect of design cues. As also argued by Bargh and Gollwitzer (1994) and Chartrand (2005), a person could be either unaware of the stimulus that causes a process, could be unaware of how a stimulus is interpreted, or could be unaware of what stimulus influenced a certain judgment or behaviour. Often, consumers fall into the third category, where they lack awareness of how their behaviour is affected by specific cues (Dijksterhuis, Smith, Van Baaren, & Wigboldus, 2005; Martin & Morich, 2011). With regards to packaging design cues, it has been demonstrated that these cues influence product preferences, even while respondents report that packaging design is unimportant in shaping these preferences (Mueller, Lockshin, & Louviere, 2010; Spence, 2012). Thus, there seems to be a discrepancy between the actual diagnosticity and the perceived diagnosticity of packaging design cues.

On the other hand, explicit cues such as price, brand, and claims, are often consciously used as easy-to-process sources of information about quality related attributes (Bagwell & Bernheim, 1996; Mitra, 1995; Mueller et al., 2010; Rao, 2005). As argued by Rao (2005), consumers do so because such cues require little resources to process. This implies that consumers use them purposively to assess product quality (Bagwell & Bernheim, 1996; Bettman, John, & Scott, 1986; Mitra, 1995; Rao, 2005). Indeed, processing mode theories recognize that consumers may actively search for such easy-to-process cues to base their judgment on in situations where objective information is lacking or not salient (Chaiken & Eagly, 1989; Maheswaran & Chaiken, 1991).

Since design cues such as colour and shape connote a symbolic, abstract, and highly associative meaning (Underwood, 2003), but are less often perceived as diagnostic sources for product attributes by consumers, they are not likely to be identified or purposively used as

tools to assess product attributes. Therefore, their perceived diagnostic value should be lower than that of explicit attribute cues, such as price, brand name or claims (see also Akdeniz, Calantone, & Voorhees, 2013). Moreover, product design features are more likely than explicit attribute cues to be processed automatically and unconsciously when a product is considered for purchase. Hence, packaging design serves as a rather implicit cue for product attributes.

2.2. Effects of design cues on attribute inferences

The effect of several structural (i.e., shape related) and graphical (print related) packaging cues on perception of product attributes has been demonstrated previously. For instance, Spence (2012) discusses the properties of angular shapes to connote bitterness, whereas round shapes are associated with sweetness. In a similar vein, angularity in packaging graphics has been shown to affect taste intensity and experiences of foods. Becker et al. (2011) demonstrate that products with an angular packaging are experienced as tasting more intense compared to products with a rounded packaging, among design sensitive participants. Furthermore, an angular packaging is associated with higher product potency, which increases price expectations.

A second type of correspondences between design elements and product inferences is that between movement (e.g., “up” versus “down”) and location (e.g., “top” versus “bottom”) on the one hand, and lightness versus heaviness inferences on the other. Van Rompay, Franssen, and Borgelink (2014) investigated effects of such packaging design cues on inferences of product ‘lightness’, and manipulated graphics on laundry detergent as either symbolizing upward or downward movement, on either the top or bottom of the packaging. Results indicate that movement visuals on the packaging connoting upward movement decreases expected intensity of the product fragrance when they are also placed on the top of the packaging. Thus, because of the upward movement, the scent is perceived as ‘lighter’. Furthermore, the weight of the packaging is expected to be lower when the visuals are depicted at the top of the packaging, compared to the bottom.

With regards to healthiness inferences, Van Ooijen et al. (2016) manipulated the height-width ratio of product packaging (i.e. drink yogurt bottles), such that it symbolized either a healthy (slim) or unhealthy (wide) body shape. It was demonstrated that slim product packaging increases healthiness perception of foods compared to wider product packaging.

Moreover, with regard to quality perception, some exploratory studies indicate that value (a specific dimension of colour that is related to “lighter” versus “darker” colours), may influence product attribute perception. For instance, a lower value (“darker”) packaging is associated with higher quality expectations (Van Ooijen, 2016) and ‘high-end’ product associations (Ampuero & Vila, 2006). However, note that these studies are of exploratory nature, as these findings rely on introspection and within subject designs.

The associations between design elements and product inferences that are discussed here can be classified as ‘embodiment effects’ of different types. Embodiment (Barsalou, 1999; Lakoff & Johnson, 1999), entails that physical experience (e.g., sensorial sensation) shapes – and is part of – the representation of abstract concepts. Van Rompay and Ludden (2015) distinguished four types of embodiment; 1) anthropomorphism, familiarity, and literal resemblances, 2) image schemas and symbolic meaning, 3) meaningful sensorial experiences, and 4) embodiment in product movement and action. The work that we have discussed here falls within different of these categories. For instance, the association between packaging shape and healthiness (Van Ooijen et al., 2017) is an example of anthropomorphism – the association between packaging shape and body shape causes individuals to infer healthiness for products with slim packages. The relationship between upward movement of a detergent’s packaging visuals and perceived lightness of its fragrance (Van Rompay et al., 2014) may be classified as an example of ‘image schema’ embodiment. Here, associations between

spatial concepts (such as upward movement and lightness) affect perceptions of abstract concepts (lightness of scent). The relationship between colour value and quality perception that has only been studied to a limited extent (Ampuero & Vila, 2006), is an example of a meaningful sensorial experience. It is suggested that the underlying embodiment mechanism responsible for this effect is the learned association between lower colour values and strength, power and competency, (Labrecque & Milne, 2011; Odbert, Karwoski, & Eckerson, 1942; Wexner, 1954).

Research on the isolated effects of packaging design cues on product attribute perception is still in its infancy. Therefore, the first aim of this study is to extend current knowledge on the effects of packaging design cues by examining how packaging design cues affect quality inferences. Our aim is not, however, to investigate how packaging design elements affect perception of product characteristics specific to certain product categories. For some product categories, for instance, design cues are used by convention to identify product types specifically within that product category. In the Netherlands, for example, red wrappers are often used to identify dark chocolate, and blue wrappers are used to identify milk chocolate. Another example is that in the U.K., skimmed milk is packed in bottles with red labels, while whole milk is identified by its blue labels. In these cases, packaging may play a more salient role as it is used by convention to identify types of products within a specific product category. This pattern can also be seen in other categories. For instance, expensive perfume is often contained in golden packaging and in bottles that may rightfully be called pieces of art. For these types of hedonic products, packaging aesthetics may be more salient in the decision process, as design may be an attribute that consumers scrutinize more thoroughly before buying the product. In this work we examine the associations between packaging design elements and product characteristics across low-involvement food product categories. We examine the role of colour value in the formation of inferences on product characteristics, and will examine these effects when (in)congruent explicit product information is available.

2.2.1. Colour value as a quality cue in marketing

Despite the large number of studies on the effects of explicit cues (e.g., price) on quality perception (Mitra, 1995; Rao, 2005; Rao & Monroe, 1989; Shiv et al., 2005), a limited number of studies have addressed the relationship between packaging colour and product quality perception. Besides anecdotal evidence (Gorn, Chattopadhyay, Yi, & Dahl, 1997; Labrecque & Milne, 2011), exploratory studies indicate that one specific component of colour – value – is likely to affect product quality inferences. The Munsell System (Munsell, 1966) is the most widely used system in psychological research on colour (e.g., Biswas, 2016; Gorn, Chattopadhyay, Sengupta, & Tripathi, 2004; Gorn et al., 1997; Labrecque & Milne, 2011), and regards value as one of three components that forms a colour, together with hue and chroma. Within this system, the value scale ranges from 0 to 10, where a value of 0 represents pure black and a value of 10 is used for pure white (Munsell, 1966). In reality, value is a continuous dimension, where “lower-value colours seem to have a ‘blackish’ quality about them, as if the colour black were mixed into the pigment [and] higher value colours have a whitish or pastel quality about them, as if the colour white were mixed into them” (Gorn et al., p. 217). Within the packaging domain, exploratory research has demonstrated that a negative association exists between value and quality perception (Ampuero & Vila, 2006; Van Ooijen, 2016). Specifically, these studies indicate that lower values are associated with higher product quality. However, these studies are explorative in nature and do not demonstrate a causal relationship between design cues and quality perception. Therefore, the first goal of this work is to verify whether a causal relationship exists between packaging value and quality perception. Although higher colour values have also shown to be associated with positivity, and lower colour values with negativity (Meier, Robinson, & Clore, 2004), we believe these results apply predominantly to the domain of positive and

negative emotions (see Landau, Meier, & Keefer, 2010, for an overview). Quality perception on the other hand, is associated with assessment of strength, power and competency, which have shown to be associated with lower value (Labrecque & Milne, 2011; Odbert et al., 1942; Wexner, 1954). This means that value, or metaphoric cues in general, may have effects on perceptions that are dependent on the situational context or type of judgement.

In line with this reasoning, we predict that packaging value affects product quality related inferences. Specifically, we predict that a lower value will increase four types of quality related inferences, namely quality perception, price expectation, expected market position of the brand, and brand attitude.

H1: Packaging value acts as a cue for quality related product inferences, such that, compared to a higher value:

H1a: A lower colour value results in a higher quality perception.

H1b: A lower colour value results in a higher price expectation.

H1c: A lower colour value results in a higher expected market position of the brand.

H1d: A lower colour value increases brand attitude.

2.3. Combining design cues and explicit cues

Besides demonstrating that consumers are influenced by design cues when they infer product attributes, we also examine the interactive effect of product design and explicit cues on product attribute perception. To our knowledge, no research has examined the effects of implicit cues when explicit quality cues, such as price, brand or claims are also available. Gaining knowledge about the effects of implicit attribute cues in the presence of explicit attribute cues is important though, because in real-life situations consumers are predominantly exposed to product packaging that contains implicit cues in such a context. However, it has never been investigated how design cues and explicit cues interact with each other in eliciting product inferences. Therefore, the aim of this study is to examine how consumers integrate design cues and explicit attribute cues in scenarios that closely represent retail situations. Specifically, our interest is to study how consumers use design information in the presence of explicit attribute cues (e.g., price, brand, and claims), and how these different types of cues affect product attribute perception of food products when they are either congruent or incongruent.

2.3.1. Cue Consistency Theory

Cue Consistency Theory (CCT; Maheswaran & Chaiken, 1991) may provide insight in how combinations of design and explicit cues are processed by consumers. The theory explains how combinations of systematic (highly diagnostic) and heuristic (less diagnostic) cues for product quality are processed in low motivation situations. This can happen in two ways, of which the first way is an *additive effect*. This occurs when the cues are congruent (e.g., they both communicate high quality). In this situation, cues communicate the same information, and the effect on evaluation of the separate effects of the two cues (both positive or negative). In other words, both cues will be used in evaluation. However, when a highly diagnostic and a less diagnostic cue are incongruent this will result in *attenuation*. In the case of attenuation, inconsistency will undermine confidence in heuristic based judgment (See also Oppenheimer, 2008). As a result, individuals will disregard the cue that they trust the least, and will base evaluations on cues that are higher in perceived diagnosticity.

Based on Maheswaran and Chaiken (1991), one would expect that in the case of congruent design and explicit cues, an additive effect of these cues takes place. Thus, an increase in quality perception as a result of low colour value will occur when the explicit cue also communicates high quality (i.e., high-end brand or high price). Furthermore, since price, brand or claims are cues that are considered as highly diagnostic cues by consumers, whereas design cues are rather implicit

(e.g., Karjalainen, 2007) we assume that price, brand and claims will have a higher cue-diagnostics compared to design cues. Drawing from CCT, one would expect that the effect of the packaging design cue will be discounted when it is incongruent with the explicit (more highly diagnostic) cue. Thus, one would expect an interaction effect between explicit quality cues and packaging design cues on product quality inferences, such that packaging design cues will only affect product quality related inferences when they are congruent with explicit cues.

H2: When packaging colour value is congruent with explicit quality cues, both cues will be used for quality related inferences (additive effect). When colour value is incongruent with explicit quality cues, it will be discounted as a quality cue (attenuation effect).

In short, we examine 1) to what extent product design acts as an implicit cue for product quality, and 2) to what extent congruence with other, explicit cues determines the efficacy of packaging design as a quality cue. In Study 1, we investigate how packaging value affects quality related inferences. In Studies 2a and 2b, we examine how packaging value affects quality perception in the presence of congruent and incongruent explicit price and brand cues.

This is the first study that investigates the interaction between packaging design cues and explicit cues on product perception. To further improve the practical relevance of the studies, we create a comparative processing context, in which participants are presented with multiple product packages at the same time (Newman et al., 2016).

3. Study 1: Effects of packaging value on quality inferences

3.1. Method

3.1.1. Participants and design

Study 1 tested Hypotheses H1a, H1b, and H1c. Participants ($N = 53$, 66% Female, Mean Age = 48.62) were recruited via several associations and participated for a financial compensation. The single factor (colour value: high vs. low) between subjects experiment was completed individually and online. Participants indicated their expectations regarding product quality for two different products (crisps and coffee), for which value was manipulated as either low or high. The order in which participants were presented with the packages was randomized between subjects.

3.1.2. Procedure

For each product, participants were randomly assigned to either the low colour value or the high colour value condition. In each condition, participants were presented with the target product (where value was manipulated) in a comparative processing context. Specifically, participants saw four different products within the concerning product category, of which one was the product of interest (Fig. 1). A comparative processing context is more cognitively challenging than a non-comparative processing context (i.e., reviewing a single product), and provides a more realistic simulation of a real-life shopping situation (Newman et al., 2016). The products and brands were foreign and unfamiliar to the participants. Furthermore, the product of interest was depicted on the same position throughout conditions.

We manipulated packaging value using two product types, crisps and coffee. For the crisps, value was manipulated by altering the value of the background of the product packaging to 75–85% in the high value condition (low quality cue) and 25–35% in the low value condition (high quality cue) using Photoshop CS6. Other visuals, such as brand logo and product images on the product packaging (including colour) were kept constant between conditions. For the coffee packaging, the background in the high value condition was adjusted to off white (low quality cue), while the background colour in the high value condition was adjusted to black (high quality cue). Other visuals such as

product images were kept constant between conditions, except for the brand logo, which was white in the low value condition, and black in the high value condition.

3.1.3. Measures

Quality related inferences were measured using three types of inferences that are used as proxies for quality. First, quality perception was measured using the 7-pt Likert scale (“The product appears to be of good quality”; 1 = “totally disagree”, 7 = “totally agree”). Second, expected market position of the brand (i.e. ‘brand perception’, low-end to high-end) was measured using the item “I expect that this is a high-end product” on a 7-pt scale. Participants also estimated the product price on a slider, ranging from 50 to 150 cents.

3.2. Results

Effects of value on quality perception (H1a), price expectation (H1b) and expected market position of the brand (H1c) were examined using SPSS software by means of a one-way ANOVA with value (low vs. high) as a between subjects factor.

3.2.1. Value of crisps packaging

Value significantly affected quality perception, $F(1, 52) = 6.74$, $p = 0.012$, Partial $\eta^2 = 0.12$. Participants in the low value (darker) condition perceived the product as being of higher quality ($M = 4.82$, $SD = 1.00$) compared to participants in high value (lighter) condition ($M = 3.92$, $SD = 1.45$). Furthermore, brand perception was marginally affected by the value manipulation, $F(1,52) = 3.12$, $p = 0.08$, Partial $\eta^2 = 0.06$. The brand was associated with a high-end brand to a higher degree when value was low ($M = 4.25$, $SD = 1.61$), compared to when value was high ($M = 3.46$, $SD = 1.70$). Moreover, value affected price estimation, $F(1,52) = 7.00$, $p = 0.011$, Partial $\eta^2 = 0.12$. When the value was low, participants expected the product to be more expensive ($M = €1.09$, $SD = 0.12$), compared to when the value was high ($M = €0.97$, $SD = 0.18$).

3.2.2. Value of coffee packaging

For the second product category, value marginally affected quality perception, $F(1,52) = 3.66$, $p = 0.061$, Partial $\eta^2 = 0.07$. Participants perceived the product to be of higher quality when value was low ($M = 5.47$, $SD = 1.41$), compared to when value was high ($M = 4.68$, $SD = 1.59$). Furthermore, brand perception was affected by the value manipulation, $F(1,52) = 5.16$, $p = 0.027$, Partial $\eta^2 = 0.09$. The brand was associated with a high-end brand to a higher degree when the value of the packaging was low ($M = 5.22$, $SD = 1.52$), compared to when the value was high ($M = 4.14$, $SD = 1.98$). Moreover, value affected price estimation, $F(1,52) = 7.57$, $p = 0.008$, Partial $\eta^2 = 0.13$. When the value was low, participants expected the product to be more expensive ($M = €2.78$, $SD = 0.42$), compared to when the value was high ($M = €2.44$, $SD = 0.48$).

3.3. Conclusion

Results of this between subjects experiment indicated that subtle variations in packaging value affect consumers’ quality related inferences. We found that lower colour value increases quality perceptions (H1a), price expectations (H1b) and brand perception (H1c). In Studies 2A and 2B, we investigate these effects in the presence of congruent and incongruent explicit quality cues.

4. Study 2: Packaging value and explicit quality cues

This study consists of two parts. In part A, the effect of packaging value on quality perception is investigated in the presence of product price as an explicit quality cue. In part B, the effect of packaging value on quality perception is investigated while now information about the

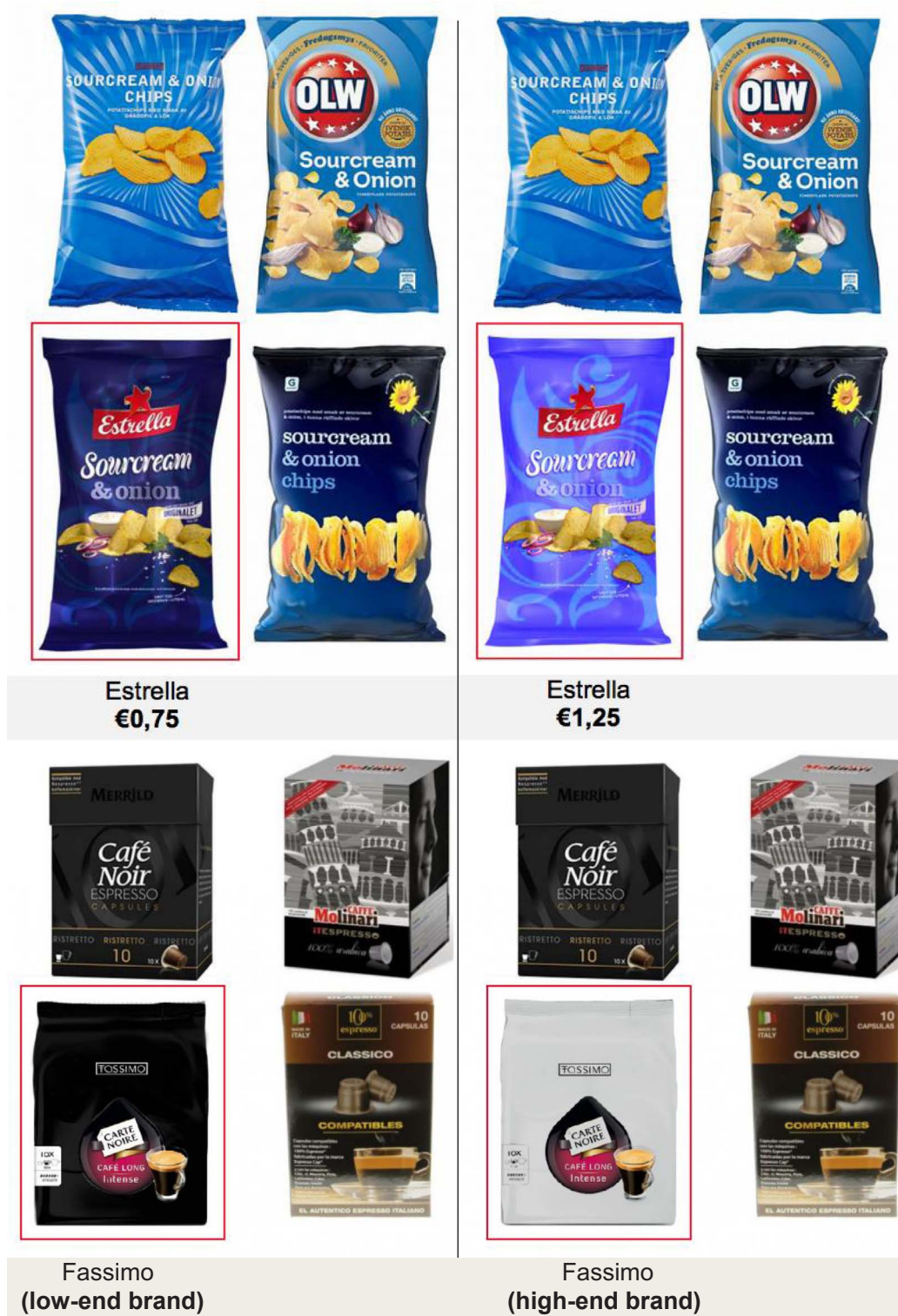


Fig. 1. Part of the stimulus material from Study 2A (with price as explicit quality cue manipulation) and Study 2B (with market position as explicit quality cue manipulation). Stimuli from incongruent conditions are depicted. Left: low value x low price and low quality conditions. Right: high value x high price and high-end brand conditions. Note that both products were used in study 2A, as well as in study 2B.

market position of the brand is made available. Thus, we study the effect of packaging value in the presence of two different types of explicit quality cues: price and brand.¹

¹ Each participant always completed part A and part B of the study with different products.

We assess quality related inferences by measuring perceived quality, perceived market position of the brand (Study 2a), price perception (Study 2b), and product attitude. Thus, besides addressing H2, this study has the aim to replicate results on H1a, H1b, and H1c, and addresses H1d in addition.

4.1. Part A: Packaging value and price

4.1.1. Method

4.1.1.1. *Participants.* Participants (N = 246, 69% Female, Mean Age = 43.36, SD = 15.85) were gathered via several associations (i.e., a drama club (n = 29), a study association (n = 37) and a choir (n = 180)) and participated for a financial compensation. The experiment was completed individually and online.

4.1.1.2. *Design and procedure.* A 2 (colour value: high vs. low) × 2 (price: low vs. high) between subjects design was used to test H2. Participants were randomly assigned to one of the value and one of the price conditions. Product type was varied between subjects, so participants were presented with either the crisp packaging condition or the coffee packaging condition.

As a cover story, participants were told that the product was being sold at a local foreign supermarket. This approach has the advantage that the brands were unknown to participants, and they did not have knowledge about objective quality, market position or price of the products. Participants received information about the market price range within the product category (50–150 cents for crisps, and 100 cents – 400 cents for coffee).

To simulate a realistic retail context, participants were, similar as in the pre-study, presented with a comparative processing context (Newman et al., 2016). Specifically, participants were presented with four different products within the concerning product category, of which one was the product of interest (target product). Price was visible immediately below the target product (see Fig. 1). The height of price per condition differed between product types (crisps: low price = 75 cents, high price = 125 cents; coffee: low price = 150 cents, high price = 350 cents) and was based on current market prices.

Quality related inferences were measured using three types of inferences that are used as proxies for quality. Based on Miyazaki, Grewal, and Goodstein (2005), quality perception was measured using a 2-item Likert scale (7-pt) including the questions “The product appears to be of good quality” and “This is probably a high quality product” (1 = “totally disagree” – 7 = “totally agree”). Also, perceived market position of the brand (low-end to high-end) was measured using the item “I expect that this is a high-end product” on 7-pt scale. Subsequently, product attitude was measured using three semantic differential scales (Chang & Thorson, 2004), “poor-good, unappealing – appealing, unattractive – attractive”. Furthermore, price perception was measured as a manipulation-check using the item “The product price is high” (1 – “totally disagree – 7 = totally agree”) on a 7-pt scale. Furthermore, the Scepticism Towards Advertising Scale (Obermiller & Spangenberg, 1998) was slightly adjusted and measured for exploratory reasons.

4.1.2. Results

4.1.2.1. *Preparatory analyses.* As age was negatively correlated with quality perception (Pearson $r = -0.16$, $p = 0.01$), we included age as a covariate in the analyses. Furthermore, we tested whether the results differed between the several subsamples of participants. Since this was not the case for any of the dependent variables, we here report analyses for the total sample. A manipulation-check indicated that perceived price was lower in the low price conditions ($M = 3.62$, $SD = 1.01$) than in the high price conditions ($M = 4.37$, $SD = 1.13$), $F(1, 237) = 76.88$, $p < 0.001$, Partial $\eta^2 = 0.25$. These effects did not differ between product types, $p = 0.20$. Furthermore, Scepticism towards advertising did not affect any of the dependent variables, and is therefore not reported further on.

To test H2, effects of value and price on quality perception, expected market position of the brand and brand attitude were examined using SPSS software by means of a two-way ANOVA with value (high vs. low) and price (low vs. high) as a between subjects factors.

4.1.2.2. *Quality perception.* Packaging value significantly affected quality perception, $F(1, 237) = 12.52$, $p = < 0.01$, Partial $\eta^2 = 0.05$. A product packaging design with a low colour value was associated with a higher quality ($M = 5.04$, $SD = 1.21$) compared to a design with a high value ($M = 4.51$, $SD = 1.21$). Price however, did not affect quality perception, $F(1, 239) = 0.17$, $p = 0.68$, neither was there an interaction effect between package value and price, $F(1, 239) = 0.014$, $p = 0.91$.

4.1.2.3. *Perceived market position.* Packaging value also affected whether the brand was perceived as high-end (vs. low-end), $F(1, 237) = 16.19$, $p < 0.001$, Partial $\eta^2 = 0.06$. The brand was associated more with high-end when the colour value was low ($M = 4.40$, $SD = 1.74$) compared to high ($M = 3.56$, $SD = 1.90$). Moreover, price did not affect perceived market position, $F(1, 237) = 1.00$, $p = 0.32$, neither was there an interaction effect between packaging value and price, $F(1, 239) = 0.12$, $p = 0.73$.

4.1.2.4. *Product attitude.* Packaging value affected product attitude as well, $F(1, 237) = 15.16$, $p < 0.001$, Partial $\eta^2 = 0.06$. Attitude towards the product was more positive when the colour value was low ($M = 3.91$, $SD = 1.34$), compared to high ($M = 4.50$, $SD = 1.32$). Price did not affect product attitude, $F(1, 237) = 0.09$, $p = 0.76$. Again, there was no interaction effect between value and price, $F(1, 237) = 0.60$, $p = 0.44$.

4.1.3. Conclusion and discussion

We found that in the presence of price as an explicit quality cue, a higher colour value product packaging decreases product quality perception, brand associations and product attitude. However, our expectations that packaging value would only affect consumer evaluations when price was congruent (e.g., a high price in combination with a low colour value) was not confirmed. Instead, we found that packaging value affects quality perception regardless of the height of the price. Furthermore, price did not affect quality inferences. These results are striking, since price has been known to affect quality inferences by consumers (e.g., Rao, 2005). Some characteristics that are specific for this study may explain these results. Possibly, the effect of product packaging value dominates the perception of quality as such that the effect of price becomes negligible for low involvement CPGs, especially since colour cues are known to grab immediate attention (Singh, 2006). Also, price may be considered as an indirect and ambiguous cue for product quality, which may have resulted in the dismissal of price as a quality cue. Past research has shown that the effect of the market position of the brand (i.e., high-end vs. low-end) on quality perception is larger than the effect of price on quality perception (Brucks, Zeithaml, & Naylor, 2000; Rao & Monroe, 1989). In part B of the experiment we investigated whether packaging value would exert the same effects when paired with a stronger explicit quality cue: brand information.

4.2. Part B: Packaging value and market position of the brand

We investigate whether product packaging value would still affect quality related consumer inferences when explicit information was provided about the market position of the brand (i.e., a low-end versus high-end brand). Participants started part B immediately after finishing Part A.²

4.2.1. Method

A 2 (colour value: high vs. low) × 2 (brand position: low-end vs. high-end) between subjects design was used to test H2. The procedure

² Each participant always completed part A and part B of the study with different products.

of Part A was followed, however, instead of price, now market position of the brand was manipulated. As a cover story, participants were told that the products were being sold at a local foreign supermarket. This time participants received the following information about the brand that they would take a look at: “Supermarkets offer many different brands, ranging from low-end to high-end brands. You will now take a look at [brand]. [Brand] is a low-end brand (high-end brand). Similar as in part A, participants were presented with a comparative processing context (Newman et al., 2016). Under the product packaging the brand name and brand information was visible (i.e. “(low-end brand)” vs. “(high-end brand)”), see Fig. 1.

Quality related inferences were measured using three types of inferences that are used as proxies for quality. Based on Miyazaki et al. (2005), quality perception was measured using a 2-item Likert scale (7-pt) including the questions “The product appears to be of good quality” and “This is probably a high quality product”. Furthermore, Price perception was measured using a 7-pt scale “The product price is high (1 = totally disagree, 7 = totally agree)”. Subsequently, product attitude was measured using three semantic differential scales (Chang & Thorson, 2004), “poor-good, unappealing – appealing, unattractive – attractive”. Furthermore, brand perception (low-end to high-end) was measured as a manipulation-check using the item “I expect that this is a high-end product” on 7-pt scale.

4.2.2. Results

4.2.2.1. Preparatory analyses. We tested whether the results differed between the several subsamples of participants. Since this was not the case for any of the dependent variables, we here report analyses excluding this variable. A manipulation-check indicated that the brand was perceived more as high-end in the high-end condition ($M = 4.39, SD = 0.16$), compared to the low-end condition ($M = 3.44, SD = 0.17$), $F(1,237) = 16.43, p < 0.001$, Partial $\eta^2 = 0.07$. These effects did not differ between product types, $p = 0.80$.

To test H2, effects of value and brand on quality perception, price expectation and brand attitude were examined using SPSS software by means of a two-way ANOVA with value (high vs. low) and brand (low-end vs. high-end) as a between subjects factors.

4.2.2.2. Quality perception. When information about the market position of the brand was made available, package value significantly affected quality perception, $F(1, 237) = 11.99, p < 0.001$, Partial $\eta^2 = 0.05$. A product packaging design with a low colour value was associated with a higher quality ($M = 4.85, SD = 1.28$) compared to a design with a high value ($M = 4.26, SD = 1.43$). Furthermore, market position of the brand affected quality perception, $F(1, 237) = 20.90,$

$p < 0.001$, Partial $\eta^2 = 0.08$. Quality perception was higher when the brand was high-end ($M = 4.94, SD = 1.31$) compared to low-end ($M = 4.17, SD = 1.36$). There was no interaction effect between colour value and brand, $F(1, 237) = 1.59, p = 0.21$.

4.2.2.3. Price expectation. Packaging value also affected price inferences that participants made about the product, $F(1, 237) = 27.71, p < 0.001$, Partial $\eta^2 = 0.11$. The product was expected to be more expensive on a 7-pt scale when the colour value was low ($M = 4.34, SD = 1.42$) compared to high ($M = 3.40, SD = 1.58$). Moreover, market position of the brand affected price inferences, $F(1, 237) = 58.53, p < 0.001$, Partial $\eta^2 = 0.20$. Price expectations were higher when the brand was high-end ($M = 4.51, SD = 1.48$) compared to low-end ($M = 3.22, SD = 1.42$). There was a significant interaction effect between value and brand, $F(1, 237) = 3.99, p = 0.047$, Partial $\eta^2 = 0.02$. The effect of packaging value on price inferences was slightly stronger when the brand was presented as low-end ($B = 1.27$), compared to high-end ($B = 0.56$).

4.2.2.4. Product attitude. Packaging value affected product attitude as well, $F(1, 237) = 19.83, p < 0.001$, Partial $\eta^2 = 0.08$. Attitude towards the product was more positive when the colour value was low ($M = 3.67, SD = 0.95$), compared to high ($M = 3.11, SD = 0.99$). Furthermore, brand affected product attitude, $F(1, 237) = 6.91, p = 0.009$. Product Attitude was higher when the brand was high-end ($M = 3.56, SD = 1.02$) compared to low-end ($M = 3.23, SD = 0.97$). There was no interaction effect between value and brand, $F(1, 237) = 0.86, p = 0.35$.

4.2.3. Conclusion and discussion

We found that independently from brand as an explicit quality cue, a lower colour value product packaging positively increases product quality perception, price inferences, and product attitude. Again, our expectation that a lower colour value packaging would only affect consumer evaluations when brand was congruent (e.g., a high-end brand in combination with a lower value) was not confirmed. Instead, we found that colour value affects consumer evaluations either when the brand is a high-end or a low-end brand. Furthermore, we found that regarding price expectations, the effect of packaging colour value was slightly stronger for low-end brands compared to high-end brands. Thus, also in the presence of a stronger quality cue than price (Brucks et al., 2000; Rao & Monroe, 1989), packaging design may exert a strong effect on consumer evaluations (See Table 1 for a summary of the results).

Table 1

Results of 1-way ANOVA (Study 1) and 2-way ANOVA's (Studies 2a–2b). Effects on four dependent variables, quality perception, expected market position, expected product price, and product attitude are presented. Note that significant effects of value indicate that lower values (corresponding to “darker” packaging) elicit higher scores on each dependent variable.

Study	IV	Quality perception	Expected market position	Expected product price	Product attitude
1 (pre-test)	Value				
	crisps	partial $\eta^2 = 0.12$ $p = 0.012$	partial $\eta^2 = 0.06$ $p = 0.08$	partial $\eta^2 = 0.12$ $p = 0.011$	–
	coffee	partial $\eta^2 = 0.07$ $p = 0.061$	partial $\eta^2 = 0.09$ $p = 0.027$	partial $\eta^2 = 0.13$ $p = 0.008$	
2a	Value	partial $\eta^2 = 0.05$ $p < 0.001$	partial $\eta^2 = 0.06$ $p < 0.001$	–	partial $\eta^2 = 0.06$ $p < 0.001$
	Price	ns	ns	partial $\eta^2 = 0.25$ $p < 0.001$ (manipulation check)	ns
	Price x value	ns	ns	–	ns
2b	Value	partial $\eta^2 = 0.05$ $p < 0.001$	–	partial $\eta^2 = 0.11$ $p < 0.001$	partial $\eta^2 = 0.08$ $p < 0.001$
	Brand	partial $\eta^2 = 0.08$ $p < 0.001$	partial $\eta^2 = 0.07$ $p < 0.001$ (manipulation check)	partial $\eta^2 = 0.20$ $p < 0.001$	partial $\eta^2 = 0.09$ $p = 0.009$
	Value x brand	ns	–	partial $\eta^2 = 0.02$ $p = 0.047$	ns

5. General discussion

Two studies demonstrated that for different products, packaging design of CPGs significantly influences quality related inferences. Furthermore, we found that in general, packaging design affects quality related inferences independently from explicit attribute information (i.e., price or brand) when this information is visible.

These findings do not confirm our expectations that packaging design would only affect attribute perception when its elicited associations would be congruent with explicit attribute information (Maheswaran & Chaiken, 1991). On the contrary, our results indicate that in the case of CPGs, packaging design is an important communicator of product attributes, which affects product perception independently from explicit product cues. Thus, other than explicit cues for high-involvement products (e.g., Maheswaran & Chaiken, 1991; Mitra, 1995), packaging design exerts an effect on product quality perceptions that is independent from other (explicit) attribute cues.

Specifically, we demonstrated that the use of lower colour value in packaging positively affects product quality inferences for CPGs, either in the presence of congruent or incongruent price and brand information. When price information communicated either a low or a high quality, colour value affected quality inferences, inferences about the market position of the brand, and product attitude, and the effect of price disappeared. This demonstrates that at least for CPGs, consumers may use packaging design more than they use price in product purchase consideration. When a stronger explicit quality cue – market position of the brand – was presented, the effect of packaging design persisted independent of the effect of brand position.

The Associative Propositional Evaluation model (APE; Gawronski & Bodenhausen, 2006) may explain why the effect of design cues was not dependent on congruence with explicit quality cues, and was even stronger than the effect of explicit cues in the case of price information. The APE states that different processes constitute the formation of implicit and explicit evaluations. Implicit processes do not require an intention to evaluate the object and are activated irrespective of whether the person considers the evaluation to be accurate. Explicit processes on the other hand, involve conscious inferences for which validity is assessed. This could result in stronger effects of implicit cues compared to explicit cues, since the objectivity of explicit cues is more likely to be invalidated. As a result, the diagnosticity of the explicit cue is more likely to be discounted, which could result in a decreased persuasive effect. However, our results cannot be fully explained by the APE, since explicit cues were not discounted in all cases. For instance, the effect of brand as a quality cue persisted, even when the design cue communicated low quality though value. Therefore, future research should aim to examine which types of processes (implicit or explicit) apply to which types of cues (design, and more explicit cues), especially in the context of food products. Possibly, the effect of implicit cues such as packaging is stronger for low involvement (food) goods, compared to the higher involvement goods that have typically been studied in cue-studies (e.g. Miyazaki et al., 2005).

In addition, different types of symbolic or metaphoric cues (i.e., colour, shape) may also differ with regards to the level of abstraction with which they communicate. The meaningful sensorial experiences type of embodiment (e.g., a colour manipulation that is intended to induce associations with potency, strength, and quality), may be more abstract and ambiguous compared to the more concrete image schema type of embodiment (e.g., upward movement though dynamic visuals that is intended to communicate lightness). On the one hand, such a concrete manipulation may be less ambiguous and result in stronger inferences. On the other hand, such a manipulation may also be more blatant, and may therefore be recognized as a persuasion attempt. This may in turn incline individuals to validate or question the true diagnosticity (or objectivity) of the cue (Gawronski & Bodenhausen, 2006). As a result, a less abstract metaphoric cue will be discounted as objective cue (especially in the presence of explicit claims), while this may

not be the case with more abstract cues. Further research is necessary to investigate how level of abstraction in (metaphoric) packaging design affects design effects on product inferences, and whether effects of metaphors in design vary with type of embodiment.

Furthermore, in this study we used real but unfamiliar brands, to make sure that responses were not affected by associations with or attitudes about brands that were already familiar to participants. Since consumers are merely presented with familiar brands in real life, future research should investigate how packaging design affects product evaluation for familiar brands. For instance, packaging design may not affect brand associations for brands that are already highly associated with certain attributes, or may only affect brand evaluations when it communicates attributes that are incongruent with existing brand associations.

To increase the external validity of this study we examined the effects of design cues and implicit cues in a comparative processing context. The disadvantage of this approach is the risk that the demonstrated effects are confounded with characteristics of the contextual packaging cues – even when the processing context is kept constant between conditions. For instance, in our studies the value composition of all four packages differs between experimental conditions. That is, while in some conditions the package colour of the target product may be more salient because of a contrast effect with regards to the values of the contextual packages, in other conditions the target product ‘blends in’ with the majority of the contextual packages. This may possibly result in confounding effects. However, by finding systematic effects of packaging cues throughout different product categories and different product set compositions, we are able to dismiss the possibility that these effects confounded our results to a large extent.

Also, future studies should address to what extent the strength of different design cues affects product attribute perception. For instance, colour cues are more salient than structural (e.g., shape-) cues in the market place, and some design cues may be more implicit or subtle than others. Furthermore, to extend practical relevance, the effect of multiple design cues should be investigated. As packaging design contains numerous different elements, further studies could address, for instance, the effect of colour, shape, typeface and graphics in combination with explicit attribute information.

This research replicated and extended research on the effectiveness of packaging design as a product attribute cue. Furthermore, this is the first study that demonstrates how packaging design affects product perception in the presence of explicit product information. Since our results indicate that overall, packaging design affects product perception regardless of other explicit attribute cues on or around the packaging, this research provides valuable knowledge to practitioners who benefit from such knowledge, such as brand strategist and packaging designers.

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