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Packaging design as communicator of product attributes

Effects on consumers' attribute inferences

Iris van Ooijen

Amsterdam, november 2016

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Packaging design as communicator of product attributes

Effects on consumers' attribute inferences

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ter verkrijging van de graad van doctor

aan de Universiteit van Amsterdam

op gezag van de Rector Magnificus

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1

Introduction

1.1 The silent salesperson

In a world wherein similar brands are competing to gain market share within relatively homogenous markets, a brand's success relies heavily on its branding strategy (Brown, 2001). For manufacturers, and marketers especially, packaging is considered as a means of branding – and has even been coined the 'silent salesperson' (Pilditch, 1973). Moreover, as argued by Lewis (1991), packaging is the physical embodiment of a brand's core values and identity. Within a marketing communication plan, "packvertising" is a way to reach the consumer at the very last moment before a purchase: at the point of sale. This is where the journey from a first brand exposure to the purchase of the product ends. Here, packaging may help to attract the consumers' attention, or to persuade consumers by means of product claims, logos, or subtle communications. As 40 (Elzinga, Mulder, & Vetvik, 2009) to 70 (Connolly & Davison, 1996) per cent of purchase decisions are made in the store, product packaging characteristics are indeed an important form of advertising in the decision-making process of the consumer.

The impact of packaging on consumer behaviour may be demonstrated best by its possible detrimental effects on sales. In 2009, the fruit juice brand Tropicana invested 35 million US dollars in an advertising campaign, promoting its newly implemented, dramatically changed packaging design. Less than two months later, sales had dropped by twenty per cent (equalling 30 million US dollars of revenue), which ultimately lead Tropicana to return to its original design. At that time, the total costs of the initiative summed up to over 50 million US dollars. This example illustrates the importance of successful packaging within a marketing communications plan. Nonetheless, amongst both scholars and practitioners, the relevance and effects of packaging design in the consumer decision journey are not yet widely understood (Azzi, Battini, Persona, & Sgarbossa, 2012; Elzinga et al., 2009). Therefore, this dissertation addresses the possible effects and implications of product packaging characteristics on consumers' product evaluations.

1.2 Explicit packaging cues and attribute inferences

In store environments, which typically provide a large amount of stimuli, consumers often lack the ability to systematically process product attributes, such as nutrition or ingredient information. Consumers also frequently lack the motivation to systematically process this information, especially with regard to low involvement goods, such as food products. Moreover, with regard to experience attributes such as quality and flavour, the consumer can only assess these attributes after s/he purchases and consumes the product (Boulding & Kirmani, 1993; Spence, 1973). To make inferences

regarding such experience attributes, consumers may – either consciously or not – use marketer provided cues that communicate these attributes and that require less cognitive resources to process (Kahneman, 2003; Sloman, 1996; Strack & Deutsch, 2006). Brand logos, hallmarks, prices and labels are examples of cues that affect consumer inferences on attributes such as product quality (e.g., Brucks, Zeithaml, & Naylor, 2000; Islam, Louviere, & Burke, 2007; Rao & Monroe, 1989) and product healthiness (Andrews, Netemeyer, & Burton, 1998; Hersey, Wohlgenant, Arsenault, Kosa, & Muth, 2013; Lee, Shimizu, Kniffin, & Wansink, 2013). Such cues provide consumers with heuristic, “fast and frugal” information on these product attributes. As is the case with all heuristics, however, such inferences often result in cognitive fallacies, since they are not generalizable to all situations and can therefore result in judgmental errors. For example, although a high price may be suggestive of high product quality (e.g., Rao & Monroe, 1989) and an ecological label may be associated with product healthiness (e.g., Schuldt & Schwarz, 2010), these inferences often prove false. Nonetheless, it has been established that consumers base inferences on these types of cues automatically and sometimes deliberately (Rao, 2005; Veblen, 1953), as they have shown to be informative in the past.

1.3 Packaging design and attribute inferences

In this dissertation, it is argued that “packvertising” goes beyond the view of packaging as a communication vehicle for logos, claims and product descriptions. More specifically, it is proposed that packaging has the ability to affect product attribute inferences through unobtrusive features in its design. Packaging design is defined as *the graphic and structural elements that comprise a packaging, such as shape, color, size and typeface* (See also Karjalainen, 2007; Underwood, 2003; Van Rompay, Pruyn, & Tieke, 2009). These elements may serve as implicit cues that have the capacity to draw attention and connote product attributes through associations. In contrast to explicit cues such as price, brand or claims, these implicit design cues are not immediately consciously perceived and recognized as informative by the consumer. That is, just as consumers may be unaware of the smell of freshly baked bread when they enter a supermarket, they may be unaware of packaging design when they choose a product. Instead, they may deliberately process explicit cues that they perceive as informational for a relevant attribute, such as labels for healthiness, or price for quality. Rather than explicitly communicating information (e.g., Silayoi & Speece, 2004), packaging design may induce automatic product associations or ‘make sense’ when it is used in way that is congruent with consumer expectations or with the identity of the product (Karjalainen, 2007). In other words, packaging design relates more to the subconscious side of decision-making (Silayoi & Speece, 2004). Furthermore, even if consumers are aware of packaging design elements, it is the unawareness of its persuasive effect wherein design differs from explicit packaging cues. As also argued by Chartrand (2005), consumers may or may not be aware of the presence of a (design) cue, but usually lack awareness of the automatic persuasive effect it evokes.

Earlier work on packaging design elements merely addressed effects of packaging design on aesthetical evaluation and visual attention (Bloch, 1995; Hekkert, 2006; Meyers-Levy & Tybout, 1989; Van Rompay & Pruyn, 2011; Veryzer & Hutchinson, 1998). For instance, research has indicated that (proto)typical packaging design (packaging design typical for products within a given product category) is preferred to atypical product packaging (Loken & Ward, 1990). This effect may be caused by fluency, which comprises that typical objects are cognitively processed with more ease compared to atypical objects. This increased ease in cognitive processing induces positive affect, which the consumer automatically attributes to the object (i.e., packaging). Thus, as a result of fluency, typicality increases object attractiveness (Winkielman, Halberstadt, Fazendeiro, & Catty, 2006). Furthermore, typical design may be associated with the typical product attributes that are sought for within a product category (Veryzer & Hutchinson, 1998). Atypical packaging design on the other hand, has the advantage that it draws more attention and increases saliency in the marketplace (Schoormans & Robben, 1997). Thus, packaging design directly affects consumer attention at the point of purchase, and also affects aesthetical evaluations depending on the degree of category representation.

This dissertation, however, goes a step further than the aforementioned research by investigating how packaging design affects product attribute inferences. By studying the role of packaging design as such, this dissertation focuses on packaging design as a creator of brand identity, rather than an aesthetic, or merely attention-grabbing packaging element. Only recently, scholars have started to show interest in packaging design as a branding tool that signals product attributes by communicating these attributes in a subtle, symbolic or metaphoric way. A number of studies examining the role of such symbols and metaphors in creating product differentiation and identity are based on embodiment accounts, such as Conceptual Metaphor Theory (Lakoff & Johnson, 1999), Perceptual Symbol Systems (Barsalou, 1999), and Associated Systems Theory (Carlston, 1994). The common ground of these theories is the notion that people make inferences regarding concepts (or: attributes) by drawing from existing associations with concrete sensorimotor information, such as movement, shapes or colours. Specifically, these inferences regarding attributes are established through repeated co-occurrence between sensory states and semantic concepts. For example, the perception that high entities are often powerful (e.g., skyscrapers or high positions in hierarchies), creates a strong association between verticality and powerfulness, and hence induces inferences regarding powerfulness on the basis of verticality (or vice versa).

Similarly, packaging design elements such as shape and colour may serve as symbols or metaphors that affect product attribute inferences. For instance, the degree of angularity in packaging graphics affects taste intensity and oral-somatosensory experiences of foods, due to associations between shape and other sensory experiences (i.e., strength). Becker, Van Rompay, Schifferstein and Galetzka (2011) demonstrated, for example, that an angular product packaging changes taste perception of a dairy product. This was in particular true for participants with a high sensitivity for design, who experienced products with an angular packaging as

tasting more intense compared to products with a rounded packaging. Furthermore, an angular packaging was associated with increased product potency, which elevated price expectations. Thus, angular shapes seem to serve as metaphors for toughness and potency (see Figure 1.1). Moreover, whereas round shapes are associated with sweetness, angular shapes are associated with bitterness (see Spence, 2012, for an overview; see also Figure 1.1). Also colour is argued to be associated with taste intensity (Hine, 1995), and has shown to predict differences in flavour perception (see Hoegg & Alba, 2007, although not packaging colour, but colour of the product itself was manipulated).



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Figure 1.1 With its angular background shape, logo and typeface, the left version of Schweppes' bitter lemon packaging may connote the bitterness of this product more successfully than the right version. The right version on the other hand, more likely communicates sweetness. Moreover, the left packaging may be associated more with toughness and potency compared to the packaging on the right.

In the domain of movement metaphors, Van Rompay, Fransen, and Borgelink (2014) manipulated visuals on laundry detergent as either connoting upward or downward movement, and placed them either on the top or bottom of the front-of-packaging. Results indicated that movement visuals on the packaging connoting upward movement decreased expected intensity of the product fragrance when they were placed on the top of the front-of-packaging. That is, because of the upward movement, the scent was perceived as 'lighter'. Furthermore, the weight of the packaging was expected to be higher when the visuals were depicted at the bottom of the front-of-packaging, compared to the top. These results indicate that visuals communicating 'up' serve as metaphors that affect perceived 'lightness' of products (See Figure 1.2 for a real-life example of such a metaphor).

With regards to consumers' associations between packaging colour and product quality associations, Ampuero and Vila (2006) conducted an explorative study.

Here, it was found that higher priced, high-end products are associated with dark colours, while lower end products are associated with lighter colours (See Figure 1.3 for an example). Indeed, Adams and Osgood (1973) found that people in 23 countries evaluate black (together with red) as the most potent, strong colour. To date however, no research has systematically examined effects of packaging colour on quality perception.



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Figure 1.2 Whereas Becel Gold's claim is "full and creamy flavour", Becel Light's claim is "light, fresh flavour". This is also connoted by the direction in which the words "Gold" and 'Light' flow. Specifically, the word 'Light' is depicted in an upward direction, implicitly communicating lightness, whereas this is not the case for the word 'Gold'.



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Figure 1.3 This brand's 'premium' version of Paprika potato crisps is sold in a darker colored packaging, for a market price per weight unit that is 10 percent higher on average.

Although only a small number of studies have examined effects of packaging design on product attribute inferences, the results so far indicate that packaging design elements affect consumer inferences in subtle ways – by acting as metaphors or symbolic cues for product attributes.

1.4 Focus of this dissertation

1.4.1 Overview

This dissertation will focus on two types of attribute inferences that result from packaging design cues. First, the effects of product packaging design on quality related inferences are investigated. Second, the effects of product packaging design on healthiness related inferences are examined (See Figure 1.4 for a dissertation overview).

Whereas effects of marketing communications on product quality related inferences have been studied extensively, very little research has addressed the question how subtle packaging design cues influence product quality perception. Possibly, packaging design cues affect general product quality perception and related attributes, such as price expectations and willingness to pay. Effects of packaging design on quality related attributes are addressed in Chapters 2 and 4.

Also, as over 60 per cent of adults in Western countries are considered as being overweight (WHO, 2015), demand for healthier food has increased. Communication of healthiness related product attributes has typically been studied in the context of nutrition information, labels and product claims. Until now, no studies have addressed the role of product packaging in the communication of food healthiness to consumers. Packaging design could be a helpful aid in communicating product healthiness, which would facilitate healthier consumption. These effects will be addressed in Chapters 3 and 4.

1.4.2 Chapter 2 – Atypicality as indirect cue

In Chapter 2, we report results on an experiment that demonstrates how packaging design affects quality perception indirectly. Specifically, we argue that atypical packaging may have detrimental consequences for the evaluation of food products that are presented with so-called weak product claims. Whereas typical packaging facilitates product categorization (Schoormans & Robben, 1997), atypical packaging prevents from a fast and automatic product categorization and may increase systematic processing of explicit packaging information (See also Alter, Oppenheimer, Epley, & Eyre, 2007). Until now however, no research has focused on how atypical packaging affects the persuasive impact of packaging information, such as quality claims. Possibly, atypical packaging has different effects on consumer evaluations, depending on the nature of explicit packaging information (i.e., strong versus weak claims). In this study, participants are presented with an online shopping environment, showing a food product with either a typical or an atypical package, and product claims that are either weak or strong. Results show that atypical shaped packaging design enhances cognitive processing, which in turn decreases the persuasive impact of weak claims on willingness to pay, and increases the persuasive impact of strong product claims on quality inferences. Furthermore, product knowledge improves when packaging design is atypical, through increased processing. Hence, we demonstrate that packaging design has the properties to increase deliberative processing of explicit product information by consumers.

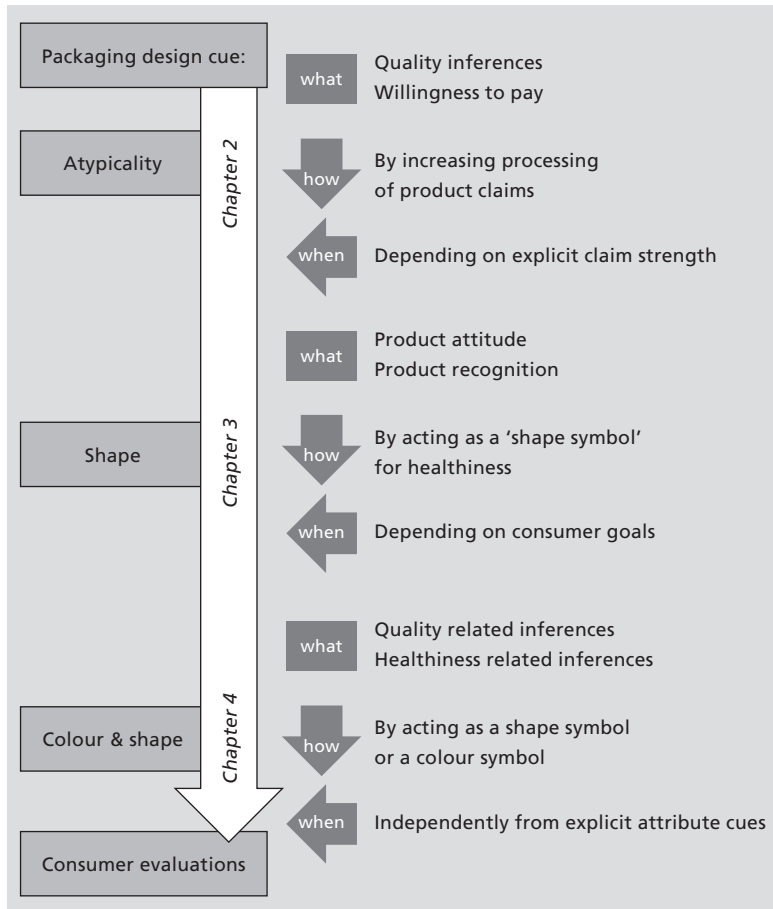


Figure 1.4 Dissertation outline.

1.4.3 Chapter 3 – Shape as healthiness cue

Whereas Chapter 2 addresses how explicit product claims affect product evaluation via packaging design elements, Chapter 3 investigates how subtle packaging design elements may affect attribute inferences directly. Inspired by embodiment accounts (Barsalou, 1999; Carlston, 1994; Lakoff & Johnson, 1999), we draw from associations between package shape and body shape, and propose that 'slimness' of packaging induces associations with healthiness. In a series of studies, we manipulate whether participants adopt a healthiness or a hedonic shopping goal, and show a product with either a slim or wide product packaging. We demonstrate that packaging shape acts as a symbolic cue for product healthiness (e.g., low in calories). Furthermore, in line with goal dependency perspectives (Bargh, 1989; Macrae, Bodenhausen, Milne, Thorn, & Castelli, 1997), we demonstrate that slim packaging affects product attitude when consumers have a healthiness goal, but not when they have a hedonic goal. We also demonstrate that products framed as 'healthy' are found relatively faster on a product shelf than products framed as 'tasty' when

they have a slimmer packaging shape. To our knowledge, this is the first study that addresses the role of packaging design elements to communicate product healthiness in an intuitive or implicit manner. Moreover, this chapter demonstrates that specific symbolic design elements may affect general product attitude particularly when they are relevant with regards to active goals.

1.4.4 Chapter 4 – Overruled by explicit cues?

In real life, packaging comprises both design elements as well as explicit attribute cues. Therefore, in Chapter 4 we address the effects of packaging design on consumer attribute inferences when congruent or incongruent explicit attribute cues (i.e., price, brand and claims) are available. Since price, brand and claims are often used as heuristic, 'fast and frugal' cues to assess product attributes, the possibility exists that explicit cues override, or at least limit the effect of packaging design cues on product attribute inferences. To investigate this notion, we present participants with product packages containing design cues that connote either low or high quality, or either a low or high amount of calories. Furthermore, explicit attribute cues that are either congruent or incongruent with the design cue (price, brand, or claims) are presented on or around the packaging. Overall, we show an additive effect of packaging design cues. That is, packaging design cues affect product attribute inferences independently from explicit attribute cues, which emphasizes their relevance in the packaging design process.

All empirical chapters in this dissertation have been published or are submitted for publication as articles in international journals. Therefore, all chapters can be read independently from each other.

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2

Atypicality as indirect cue¹

2.1 Summary

In this chapter it is examined how atypical packaging serves as an indirect cue for product attributes. Atypical food packaging draws attention in the retail environment and therefore increases product salience. However, until now, no research has focused on how atypical packaging affects the persuasive impact of other food information. In the present study, we propose that atypical packaging enhances processing of product information, affecting product claim recall and product evaluation in turn. Specifically, we argue that atypical packaging may have detrimental consequences for the evaluation of food products that are presented with so-called weak product claims. Participants (N=102) were presented with an online shopping environment, picturing a food product with either a typical or an atypical package, and product claims that were either weak or strong. Results show that atypical shaped packaging design enhances cognitive processing, which in turn decreased the persuasive impact of weak claims on willingness to pay, and increased the persuasive impact of strong product claims on quality inferences. Furthermore, product knowledge improved when packaging design was atypical, through increased processing.

2.2 Introduction

Product packaging is an important means of communication about food products, and is often used to convey product attributes as well as brand image (Becker, Van Rompay, Schifferstein & Galetzka, 2011, Celhay, Boyselle & Cohen, 2015). It has been argued that packaging has replaced the role of salespersons in the communication with consumers at the point of purchase (e.g., Rundh, 2009). This is especially relevant, because consumers increasingly postpone their food purchase decisions to the moment that they are in the store (Court, Elzinga, Mulder, Vetvik, 2009). However, communication through packaging has become more challenging for brands, since the number of products that is offered in a supermarket is doubled every ten years (Cross, 2000). This has resulted in a cluttered store environment, where an abundance of products is offered. In such an environment, purchase decisions are often not based on systematic and critical evaluation of product features, but rather on heuristic, "fast and frugal" processing of packaging cues (Dijksterhuis, Smith, Van Baaren, & Wigboldus, 2005; Grunert, 2005). Marketers respond to this development by using various visual techniques to increase the consumer's attention, such as the

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use of original materials, shapes and colors in their packaging (Piqueras-Fiszman, Velasco, Salgado-Montejo & Spence, 2013; Silayoi & Speece, 2007). Examples include P&G's Pringles potato chips packaged in a tube instead of a bag, and Toblerone's triangle-shaped chocolate bar.

In the present study, however, we propose that atypical food packaging, rather than being a persuasive cue itself, affects the persuasive impact of other information that is available on or around the product. Specifically, we argue that atypical packaging serves as a cue that increases consumer motivation to scrutinize other information that is presented on or alongside the product, such as claims about nutritional value, quality or hedonic attributes. As a result, atypical packaging will motivate consumers to distinguish high quality information, such as strong or informative product claims, from low quality information, such as weak or unimportant product claims that are visible on or around the product package (c.f., Verlegh, Steenkamp & Meulenberg, 2005). Therefore, we argue that the use of weak product claims (e.g., "new formula") may have a detrimental effect on purchase related outcomes, but only when packaging is atypical, and not when the packaging is typical. We investigate this notion by showing participants a typical or atypical product packaging with either weak or strong product claims, and measure the processing of product information as well as consumers' product evaluations.

2.3 Conceptual framework

2.3.1 Typicality and product evaluation

Typicality is the degree to which an object is representative of a category (Veryzer & Hutchinson, 1998). While there are a number of studies that have examined how typicality (or atypicality) in packaging and design influences product evaluations, there is no clear consensus on whether atypical packaging has either positive or negative effects on product evaluation.

On the one hand, the categorization literature suggests that typical objects are generally preferred to atypical objects. For instance, Winkielman, Halberstadt, Fazendeiro, and Catty (2006) demonstrate the 'beauty-in-average effect': geometric shapes are found to be more attractive when they resemble a prototypical shape (e.g., a square), and this effect is mediated by an increased processing fluency. Similarly, Loken and Ward (1990) show that the degree of typicality in product design is positively related to packaging evaluations and overall product evaluations. These authors analysed existing brands over eight product categories, and found a positive relationship between the degree of category resemblance of the packaging and product evaluation. As an explanation for these findings, Loken and Ward suggest that typical items are perceived to have more value for fulfilling a goal, since they share more attributes that serve that goal (c.f., Veryzer & Hutchinson, 1998). Similarly, Nedungadi (1990) argued that consumers have the tendency to consider brands that look typical for a product category, because they expect that those brands perform well.

On the other hand, research on product design suggests that atypicality may increase product preference in some circumstances. For instance, people associate atypical, novel products with exclusiveness, expensiveness, and therefore with high quality (Creusen & Schoormans, 2005). Also, atypical looking products are more likely to draw attention, which enables the product to become part of the consumer's consideration set. This is especially the case for food products in highly competitive categories, where many alternatives are offered (Garber, 1995). Along the same lines, Schoormans and Robben (1997) showed that atypical packaging characteristics such as a different colour, size or shape within the assortment, increase the attention that is directed towards the product by the consumer. As a result, atypical packaging increases the likelihood that consumers change their existing behavioural patterns or routines at the point of purchase.

2.3.2 Typicality effects on information processing

The aforementioned research has largely focused on effects of typicality on product evaluations, but – to the best of our knowledge – has paid limited attention to the implications that atypicality may have for the processing of other available product information. This is unfortunate, because food packaging generally contains lots of information that is aimed to inform or persuade consumers. In this section, we will argue that, if atypical packaging leads to an increased amount of attention towards the product, it is likely that typicality affects the way in which product information is processed by consumers. More specifically, we propose that atypical packaging (1) affects retention of product claims that are available on or around the product, and (2) determines the persuasive impact of these claims.

2.3.3 Persuasive impact of product claims

Food packaging often contains several claims that communicate product attributes that are thought to be persuasive. But not all these claims are equally informative. Frequently used claims like “best choice” and “new formula” may seem valuable, but are in fact weak and subjective arguments for product quality (see also Nancarrow, Tiu Wright, & Brace, 1998; cf. Ford, Smith, & Swasy, 1990). However, when consumers engage in heuristic, fast and frugal processing, the mere presence of such claims may impact product evaluation. If consumers engage in more critical processing of such claims though, information about the meaning of these claims (a systematic cue) may override effectiveness of the heuristic cue (e.g., the presence of any claims at all), and thus reduce their impact on product evaluations (Verlegh, Steenkamp & Meulenberg, 2005).

In the present study, we propose that atypical packaging might affect product evaluation indirectly, via increased and therefore more critical processing of product claims. Therefore, we predict that product evaluation will decrease when the product package contains heuristic claims, but only when the product package is atypical. Similarly, we predict that product evaluation will increase when the package contains substantive cues, but only when the product package is atypical. Although this relationship has not been examined in the context of typicality, some support for this notion may be found in a study on heuristic processing of product reviews

(Alter, Oppenheimer, Epley, & Eyre, 2007). This study showed that attention-grabbing fonts decrease susceptibility to persuasive, heuristic messages. Specifically, participants were presented with a review of an mp3-player, for which the masthead was printed in either an easy- or a difficult-to-read (attention-grabbing) font. The authors demonstrated that participants in the difficult-to-read font condition preferred the mp3-player when the information was convincing (but the person presenting it looked less competent), while participants in the easy-to-read font condition preferred the mp3-player when the person looked competent (but the information was less convincing). In other words, Alter and colleagues showed that participants in the attention-grabbing font condition pay more attention to arguments (and less to heuristic cues), while participants in the normal font condition pay more attention to heuristic cues (and less to arguments).

In line with these results, we hypothesize that atypical packaging design enhances information processing, and therefore decreases the persuasiveness of weak (i.e., unimportant and unconvincing) product claims, and increases the persuasiveness of strong product claims. In sum, we expect that:

H1: Atypical packaging (versus typical packaging) results in increased recall of product information via increased processing of the product.

H2: Weak product claims will decrease product evaluations, but only when packaging is atypical (vs. typical), because of increased processing of the product.

H3: Strong product claims will increase product evaluations, but only when packaging is atypical (vs. typical), because of increased processing of the product.

2.4 Pre-tests

2.4.1 Packaging designs

In a pre-test, we manipulated packaging designs of frequently purchased super-market products. Packaging designs for several products, such as ketchup, coffee, and milk were designed using Adobe Photoshop CS6. For every product category, we designed a package that looked typical for the category, as well as a package with an atypical shape. Brand logos and basic information (i.e., volume) were placed on the package designs, and held constant within each product category. Participants ($N = 41$) judged on a 7-point scale to what extent the product designs looked typical for a product in the concerning category (i.e., the variable typicality), as well as the attractiveness, price and quality of the products as control variables. An ANOVA showed that the differences on typicality between the typical design ($M = 6.35$; $SD = .98$) on the one hand, and the atypical shape ($M = 2.20$; $SD = .94$) design on the other hand, were largest within the ketchup category. A Mixed Models ANOVA with design (*typical*, *atypical*) as within subject factor and attractiveness, price, and quality inference as repeated covariates showed that there was also a difference on visual attractiveness between the typical ketchup ($M = 5.15$; $SD = 1.35$) and the atypical ketchup design ($M = 3.02$; $SD = 1.92$), $F(1,142) = 29.88$, $p < .0001$. However, this did not change the effect of design on typicality. There were no differences in price and quality perception between the designs. Therefore, the

typical and atypical package designs of ketchup were used as stimulus material in order to manipulate typicality in the main study².

2.4.2 Product claims

To manipulate product claim strength, several product claims were pre-tested in an online study ($N = 29$). Candidate claims were identified by looking at available packages, which resulted in a preliminary list of claims, that were each judged on a 2-item 7-point claim quality scale ($\alpha_{\text{mean}} = .78$), which assessed both the importance and persuasiveness of a claim in the consideration to purchase ketchup. Three product claims that scored amongst the highest and three claims that scored amongst the lowest on claim strength were selected to serve as manipulation of product claim strength in the main study. Also, the product claims were chosen so that both the weak and strong category contained claims that gave information about the packaging, as well as about the product itself. The three strong product claims (*well sealable*, $M = 5.11$, $SD = 1.47$; *full of flavour*, $M = 4.37$, $SD = 2.06$; *strict quality control*, $M = 4.32$, $SD = 1.62$) each differed significantly from the three weak product claims (*new formula*, $M = 2.74$, $SD = 1.38$; *also available in 800 gram size*, $M = 2.80$, $SD = 1.60$; *since 1907*, $M = 1.86$, $SD = 1.21$), all p 's $< .001$.

2.5 Main study

2.5.1 Method

Participants

We recruited 102 students (77 females; $M_{\text{age}} = 22.1$) via a university participant recruitment system in exchange for partial course fulfilment or a financial compensation of €5.

Experimental design and procedure

Participants were randomly assigned to one condition of our 2 (typicality: *typical* vs. *atypical*) X 2 (claim strength: *strong* vs. *weak*) design. The participants were directed to an online "product evaluations study", where they were asked to "take a look at three new products that are not yet available on the market". Before receiving the experimental manipulation trial with the target product, participants were first presented with two practice trials. Participants were asked to click on the product name in a simulated web shop, which directed them to the product page. This page showed an image of the product as well as three product claims³. The participants were instructed to look at the product as they would do in the supermarket, and they were free to continue to exit the product page when they decided to. In the experimental trial, we manipulated typicality by showing the participants either the typical or atypical design. Furthermore, in each condition, half of the

² Besides the typical and atypical (shape) condition for ketchup, an "atypical color" condition was also adopted in the experiment initially. Since we found no significant effects between the typical and atypical colour condition on our dependent variables in the main study, these data are not discussed here.

³ In the practice trials, product claims were chosen that were pretested as moderate in strength.

participants were presented with the weak product claims, and the other half was presented with strong claims (see Figure 2.1).

Processing

In order to measure the degree to which participants engaged in processing of information on the product page, we measured the duration of attention that was devoted to this information (Smith & DeCoster, 2000; Winkielman et al., 2006). Specifically, attention duration was calculated by identifying the exact time that participants clicked on the link to the product page, and the time they clicked to continue to the next page.

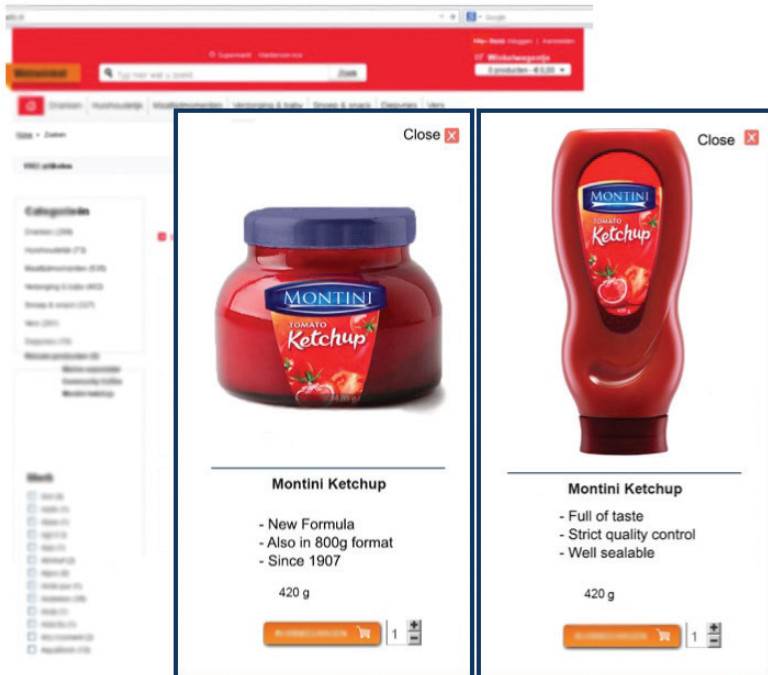


Figure 2.1 Stimuli in the atypical shape x weak claim condition (left) and typical shape x strong claim condition (right). Participants were presented with the product page after they clicked on the product name in a simulated online store (background). A next-button on the bottom of the screen enabled participants to continue.

Claim recall

We operationalized recall of product claims by assessing the number of claims that participants recalled correctly. Participants were asked to recall the three claims and to write them down. Specifically, they were instructed to try to remember the three claims, and they were permitted to leave one or more fields blank if they failed to do so. The variable claim recall was calculated by adding up the amount of correctly recalled product claims, ranging from 0 to 3. When the wording of the recalled claims was different than the presented claims, though the meaning of the claims was the same, the claim was coded as recalled correctly.

Evaluations

After the manipulation, we measured product evaluations in several ways. We assessed purchase intention by asking participants for the likelihood that they would buy the product if it would be available in their supermarket, on an 11-point Juster Scale (Juster 1966; Wright & MacRae, 2007). Also, we measured willingness to pay by asking participants for the price they were willing to pay. Participants were asked to indicate an amount between 0.00 and 3.00 Euros on a slider scale (Miller, Hofstetter, Krohmer, & Zhang 2011). Subsequently, quality inference of the product was assessed using a 7-point Likert Scale with the question "How do you estimate the quality of this product?", where 1 means "very bad" and 7 means "very good" (Zeithaml, Berry, & Parasuraman, 1996).

Manipulation check

In order to assess whether the atypical designs were indeed perceived as less typical than the typical design, we conducted a manipulation check by asking participants to rate on a 10-point scale how representative they found the packaging of Montini Ketchup for the category ketchup (Veryzer & Hutchinson, 1998). The number 1 represented "a very bad example of my idea of a ketchup package", whereas 10 represented "a very good example of my idea of a ketchup package"

Control variables

Since it is possible that the degree of involvement that consumers experience with ketchup influences our hypothesized effects, we measured product involvement (i.e., the level of a consumer's interest in purchasing a certain product type) and brand decision involvement (the importance of buying the right brand) using the Product Involvement (three items; $\alpha = .82$) and Brand Decision Involvement (three items; $\alpha = .85$) subscales of the Product Involvement Scale (Mittal & Lee, 1989). As a secondary measurement of product involvement, we asked participants whether they had purchased ketchup in the past and if yes, how often.

Since the possibility exists that need for cognition interferes with the processing style that we hypothesize to be induced by our typicality manipulation (e.g., Sojka & Giese, 2001), we included the 18-item Need For Cognition Scale ($\alpha = .83$) from Cacioppo and Petty (1982) as a control variable.

To measure whether consumers are open to new (product) experiences, we assessed the 7-item Change Seeker Index (CSI; Steenkamp & Baumgartner, 1992; $\alpha = .83$). This 5-point scale measures the degree to which individuals engage in exploratory behaviour, such as interest in new products.

2.5.2 Results

Preparatory analyses

An ANOVA with typicality (*typical vs. atypical*) as between subject factor and perceived typicality as dependent variable, showed that the manipulation significantly affected typicality ratings, $F(1, 100) = 68.48, p < .001$, partial $\eta^2 = .41$. Specifically, the typical design ($M = 7.35, SD = 1.77$) differed significantly from the atypical

design ($M = 4.11$; $SD = 2.19$, $p < .001$). None of the control variables influenced the hypothesized effects in our analyses. Therefore, these variables are not further discussed (for a correlation table between control variables and variables in the design, see Appendix A). Since the variable processing was positively skewed, we log-transformed this variable after which the variable reached a normal distribution. Untransformed means of processing are reported in the results, due to reasons of interpretation. Furthermore, we removed one outlier with a processing score of more than two times the inter-quartile range within conditions (see Stevens, 1984).

Atypicality and processing

An ANOVA showed that typicality significantly affected processing as measured by attention duration, $F(1, 100) = 11.50$, $p < .001$, partial $\eta^2 = .10$. Participants in the atypical condition engaged in more extensive processing ($M = 19.27\text{sec}$, $SD = 12.78\text{sec}$) compared to participants in the typical condition ($M = 13.95\text{sec}$, $SD = 9.35\text{sec}$)

Atypicality and claim recall

To test the hypothesis that atypical packaging (versus typical packaging) results in increased processing of the product, which in turn increases product claim recall, we used Preacher and Hayes' (2008) mediation method (Model 4; Hayes, 2013). We used 5000 bootstrap samples with bias corrected confidence intervals of 95%. The mediation analysis revealed a positive effect of typicality on processing, $b = .164$, $p = .001$. In turn, processing had a positive effect on the number of recalled product claims, $b = .577$, $p = .004$. In line with our hypotheses, typicality did not affect claim recall directly ($p = .267$), but the indirect effect of typicality on claim recall through processing was significant, $b = .095$, $SE = .04$, 95%, $CI [.031, .195]$. This means that participants who were exposed to the atypical product packaging (vs. the typical packaging) processed the message more extensively and therefore recalled more product claims.

Effects on product evaluations

We tested whether perceiving an atypical shaped packaging design negatively affected product evaluations through a longer processing towards product information when product claims were weak, and positively affected evaluations through processing when product claims were strong. Again, we used Preacher and Hayes' (2008) mediation method (Model 14; Hayes, 2013) with 5000 bootstrap samples and bias corrected confidence intervals of 95%. We measured product evaluations with three variables, specifically willingness to pay, quality inference, and purchase intention.

Willingness to pay

The main effect of processing on willingness to pay was not significant, $p = .203$. We also did not find a significant main effect of claim strength, $p = .436$. In line with our hypotheses, a mediation analysis showed an interaction effect between processing and claim strength, $p = .052$, $b = -.188$. In line with these results, the indirect effect of typicality on willingness to pay through processing was not significant when

product claims were strong, CI [-.039, .054], however this effect was significant when product claims were weak, $b = -.06$, $SE = .033$, CI [-.139, -.008]. Thus, like we expected, typicality affected willingness to pay negatively through processing when product claims were weak. However, in contrast to our expectations, typicality did not affect willingness to pay through processing when product claims were strong.

Quality inference

The main effect of processing on quality inference was not significant, $p = .307$. Again, we found no significant main effect of claim strength, $p = .436$. In line with our hypothesis, we found a significant interaction effect of processing and claim importance on quality inference, $p = .030$, $b = .548$. The indirect effect of typicality on quality inference through processing was not significant when product claims were weak, CI [-.276, .066], however, there was a significant indirect effect when product claims were strong, $b = .101$, $SE = .061$, CI [.010, .255]. In line with our expectations, typicality affected quality inference positively through processing when product claims were strong, however, typicality did not affect quality inference through processing when product claims were weak (See Figure 2.2 for a graphical representation of the results).

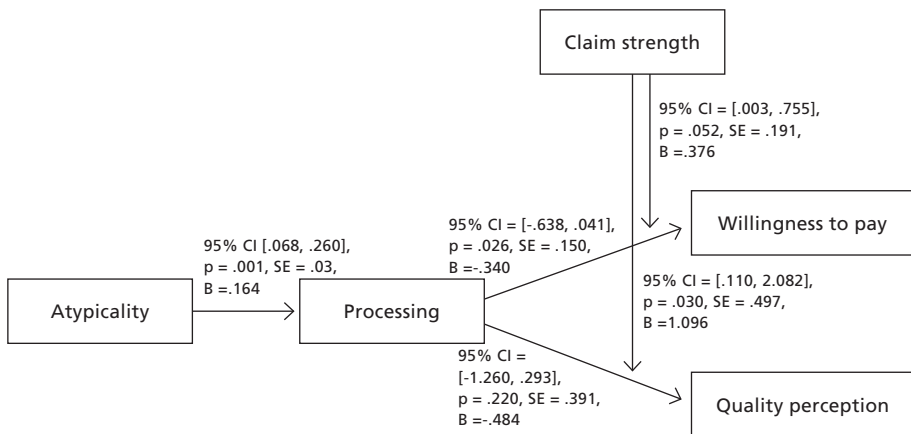


Figure 2.2 A graphical representation of the results.

Purchase intention

We did not find any main effects of processing ($p = .193$) and claim strength ($p = .636$). Contrary to our expectations, there was no significant interaction effect of processing and claim importance on purchase intention, $p = .47$. Also, the indirect effect of typicality on purchase intention was not significant for both the weak CI [-.165, .231] and strong claim condition CI [-.064, .442].

2.6 Discussion

In the present study, we investigated whether the persuasiveness of heuristic versus substantive product claims is affected by atypicality of food packaging. We found support for the hypothesis that atypical packaging design enhances processing of product information, and improves the recall of product claims presented on the product. Importantly, in line with our hypotheses, we found that the persuasiveness of heuristic and substantive product claims on the package was affected by whether the package design is typical or atypical. Specifically, we found that consumers process product claims more extensively when they are asked to evaluate an atypical as opposed to a typical product, which resulted in a lower willingness-to-pay when product claims were weak. When packaging was atypical, weak claims made consumers willing to pay less for the product than when packaging is typical, because of increased processing. Furthermore, when packaging was atypical, strong claims resulted in higher quality inferences, but only when packaging was atypical. Again, this effect was mediated by increased processing of the product. Although atypical packaging increases the persuasive effect of strong claims on quality inferences, it does not decrease the persuasive effect of weak claims on quality inferences. Moreover, whereas atypical packaging decreases willingness to pay when claims are weak, it does not increase willingness to pay when product claims are strong.

This study used a fictive brand to investigate the effects of atypical packaging and product claims on product evaluation. The absence of any effects on purchase intention may result from the use of fictive brands in our research design. Wright and MacRae (2007) concluded that the Juster Scale is a reliable scale to measure purchase (probability) intention for existing brands. However, it might be less suited to measure product evaluations of fictive brands, since participants are not well able to estimate the chance that they would buy a fictive product. The use of a fictive brand has the advantage that the effect of confounding variables such as brand image and attitudes towards the brand are ruled out. However, it is not yet clear to what extent our findings are generalizable to packaging designs of existing brands. When a brand changes its product packaging, the elements that consumers use to identify the brand should be retained. Changes in these elements could negatively affect brand equity and existing brand evaluations (Labrecque & Milne, 2012). Therefore, our results may principally generalize to new brands, or brands that have a small share. Further research is necessary to investigate these notions.

In this study, we used a dichotomous manipulation of packaging typicality, that is, the packaging was either typical or atypical. Future studies should investigate the effects of product claims in combination with increasing degrees of typicality on product evaluation (e.g., from low, to moderate, to highly typical). As Schoormans and Robben (1992) showed, consumers directed more attention towards a coffee package and evaluated the product as better when the package looked more atypical. However, when the deviation was too extreme, attention increased but the product was evaluated less positive. The authors argue that this effect may occur because the product is no longer categorized as belonging to the specific product

category when deviation from the prototype is too extreme. It remains to be investigated how different degrees of deviation from a prototype affect processing of product information, such as product claims.

Furthermore, in the present experiment, participants were presented with a single product, and were then asked to evaluate this product. We did not investigate effects of atypical design on product evaluations in an environment where the consumer is presented with more (similar) products simultaneously, such as is the case in a retail environment (cf. Roehm & Roehm, 2010). Therefore, future research should focus on how atypical design affects product perception and product evaluations in such an environment, where several products compete for the consumer's attention. Possibly, perceiving atypical packaging design of one product may not only affect evaluations about this product, but also affect the degree to which consumers process packaging of other, comparable products on the shelf. A number of studies have indicated the influence of good product design on competitiveness and commercial success (e.g., Gemser & Leenders, 2001; Thackara, 1997). In line with these studies, we showed that atypical packaging might be used to serve as a way to facilitate increased processing of product information in the consumer environment. More importantly, the present study demonstrates the importance of taking into account the interaction between different types of packaging cues when assessing the effects of these cues (e.g., product claims, packaging atypicality) on product evaluation (see also Van Rompay & Veltkamp, 2014). We demonstrated that atypicality of packaging design affects the way in which other packaging information is perceived by consumers. Atypicality decreases reliance on low quality – though often used – persuasive cues, and increases reliance on high quality cues in a persuasive setting. In contrast to typical packaging, atypical packaging increased product evaluation when claims were strong, but decreased evaluation when claims were weak. Marketers should be aware of this interaction when considering atypical packaging. Atypical packaging might be a beneficial strategy, but might only result in positive outcomes for brands with strong, substantive product claims.

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2.8 Appendix

		Purchase Intention	Willingness To Pay	Recalled Claims	Quality Inference	Typicality Manipulation Check
Need For Cognition	Pearson's <i>r</i>	-,102	,123	,186*	,065	-,142
	Sig. (2-tailed)	,216	,133	,023	,432	,083
	N	150	150	150	150	150
Product Choice Involvement	Pearson's <i>r</i>	-,133	,159	-,116	,065	-,001
	Sig. (2-tailed)	,106	,053	,158	,433	,993
	N	149	149	149	149	149
Product Involvement	Pearson's <i>r</i>	-,181*	-,043	-,083	,052	-,048
	Sig. (2-tailed)	,027	,600	,316	,532	,562
	N	149	149	149	149	149
Optimum Stimulation Level	Pearson's <i>r</i>	,013	,116	,006	,176*	-,068
	Sig. (2-tailed)	,877	,157	,941	,031	,410
	N	151	151	151	151	151

Table A1 Correlations between control variables and variables in the experimental design

3

Shape as healthiness cue⁴

3.1 Summary

In this chapter, five studies demonstrate how packaging shape affects healthiness inferences for food products. Inspired by embodiment theories, we show that packaging that simulates a slim body shape acts as a symbolic cue for product healthiness (e.g., low in calories), as opposed to packaging that simulates a wide body shape. Furthermore, in Studies 2, 3 and 5, we show that the effect of slim package shape on consumer behaviour is goal dependent. Whereas simulation of a slim (vs. wide) body shape increases choice likelihood and product attitude when consumers have a health-relevant shopping goal, packaging shape does not affect these outcomes when consumers have a hedonic shopping goal. In Study 5, we adopt a realistic shopping paradigm using a shelf with authentic products, and find that a slim (as opposed to wide) package shape increases on-shelf recognition and increases product attitude for healthy products. We discuss results and implications regarding product positioning and the packaging design process.

3.2 Introduction

As approximately 60 per cent of adults in Western industrialized countries are classified as being overweight (WHO, 2015), the demand for healthier food has increased. This is reflected in the growing market share of food that is considered as “healthier” or “functional”, such as food with added nutrients, or food that contains less sugar or fat (Colby, Johnson, Scheett, & Hoverson, 2010; Siró, Kápolna, Kápolna, & Lugasi, 2008). Moreover, food policy authorities and NGO’s are looking for ways to stimulate consumers to eat less and healthier, for instance by communicating nutrition information such as health claims, logos, or nutrition facts labels (FDA, 2015).

A number of experimental studies suggest that these types of explicit information positively affect healthiness inferences (e.g., Andrews, Netemeyer, & Burton, 1998; Hersey, Wohlgenant, Arsenault, Kosa, & Muth, 2013; Lee, Shimizu, Kniffin, & Wansink, 2013; Liem, Aydin, & Zandstra, 2012; Verbeke, Scholderer, & Lähteenmäki, 2009) and consumption behaviour (e.g., Belei, Geyskens, Goukens, Ramanathan, & Lemmink, 2012). In spite of the recent attention to more implicit means of communication (Becker, van Rompay, Schifferstein, & Galetzka, 2011; Spence, 2012; van Rompay, Fransen, & Borgelink, 2014), there has been limited attention to more

⁴ An adapted version of this chapter is resubmitted for publication as, I., van Ooijen, Fransen, M.L., Verlegh, P.W.J., Smit, E.G. *Signalling product healthiness through symbolic packaging cues: effects of packaging shape and goal congruence on consumer behaviour.*

implicit means of communicating the healthiness of foods. This is unfortunate, because implicit communication may serve as a useful tool to communicate healthiness, or to enhance or complement such explicit healthiness communication, which could be helpful in situations where consumers lack the motivation and/or ability to process explicit claims (cf., Keller et al., 1997; van Ooijen, Fransen, Verlegh, & Smit, 2016). This is a common situation in crowded and cluttered supermarkets with large assortments where distracted consumers are buying their food (See also Newman, Howlett, & Burton, 2015). In addition, when consumers do scrutinize explicit information, explicit claims may induce reactance or other types of resistance to persuasion, which reduces their effectiveness (Brehm, 1966; Darke & Ritchie, 2007; Fransen, Verlegh, Kirmani, & Smit, 2015; Friestad & Wright, 1994).

In this paper we study the use of packaging design as a means to implicitly communicate product healthiness. Although the present research focuses on packaging as an implicit cue, it should be noted that implicit cues should not be seen as a replacement of explicit communication on packaging, via text and logos. Rather, implicit communication should be seen as a supplement to more explicit messages. As a first step, however, the present work studies the effect of implicit cues for healthiness in isolation, to get an impression of its possible effects.

In this study we argue that packaging can symbolically signal healthiness of products by mimicking the shape of a healthy body. Specifically, we argue that packaging shape can implicitly communicate healthiness by simulating a slim vs. wide body shape. In this way, slim (versus wide) packaging can nudge consumers who are looking for healthy foods toward these options. Importantly, we propose that the effect of simulating body shape on these consumer outcomes is goal dependent (cf., Bargh, 1989), because the communicated healthiness attribute would be (most) relevant to consumers who are looking to buy healthy foods.

We report five studies in which we investigate the effect of packaging shape on healthiness perception and evaluative outcomes under different (i.e., relevant and irrelevant) consumption goal conditions. The contribution of this work is to demonstrate that a slim packaging shape 1) serves as a symbolic cue for healthiness and increases healthiness perception of the product, 2) makes healthy food products more appealing, and 3) serves as a cue that makes it easier to find healthy food products on the shelf. Importantly, 4) we show that the effects of packaging shape on product attitude, choice, and on-shelf product recognition are goal dependent. Specifically, we demonstrate the effectiveness of packaging shape to increase consumer evaluations when consumers have a health-focused shopping goal, while not affecting behaviour when consumers have a hedonic shopping goal. Furthermore, 5) we contribute to existing literature by demonstrating the effect of slim packaging design in a realistic retail context, hereby enhancing the external validity of the investigated mechanism.

3.3 Conceptual framework

3.3.1 Embodiment

Health is an abstract concept that has many facets, and cannot be interpreted in one single concrete way. Scholars have long been contemplating the way in which such abstract concepts (e.g., power, affection, or morality) are represented in the mind. Recent theories about cognition and perception argue that people understand abstract concepts by drawing from concrete sensory information that occurs from interaction with the environment (Barsalou, 1999; Barsalou, 2008; Lakoff & Johnson, 1999). As stated by Lakoff and Johnson (1999), repeated co-activation of concepts and sensory information in everyday experience shapes neural connections between these concepts. In other words, repeated co-activation of concepts with sensory information results in an associative connection, and understanding a concept becomes facilitated by the associated sensory information. This is for example reflected in the metaphor “prices are *high*”, which may be the result of a repeated co-activation of the sensorimotor domain *vertical orientation* and the subjective judgment of *quantity* (e.g., the observation that the levels of piles and fluids rise when quantity increases). Another example is the relationship between similarity and spatial distance, which is reflected in the metaphor “The prices are not the same, but they are *close*.” This metaphor may have evolved by observing objects on the same location more often when they are similar to each other (e.g., similar priced products on the same shelf).

A number of studies demonstrate that cognition is grounded in (i.e., based on) such sensory or motor information. For instance, Williams and Bargh (2008) found that the metaphor of a warm personality is grounded in sensory information. When participants literally experienced warmth by holding a cup with warm (vs. cold) fluid, they rated a confederate as having a “warmer” personality. Besides being grounded in sensory-motor information, some metaphors are grounded in mere visual information. Hence, this visual information serves as a perceptual symbol to understand the concept. For instance, Sherman and Clore (2009) demonstrated that morality is grounded in the perception of white, while immorality is grounded in the perception of black. In this study, the speed of colour naming increased for immoral words (e.g., greed) when they were printed in black, while it increased for moral words (e.g., honesty) when they were printed in white.

In the food domain, research on perceptual symbols has, until now, mainly focused on associations with taste (for an overview, see Spence, 2012). For instance, a positive correspondence between (manipulated) product bitterness and preferred degree of angularity of visual shapes has been demonstrated (Ngo, Misra, & Spence, 2011). Also, participants tend to associate bitterness with sharper-sounding words (i.e., words with plosive sounds, Ngo et al., 2011). Furthermore, as demonstrated by Topolinski and Boecker (2016), reading food names for which their articulation facilitate inward mouth movement (i.e., *paksoi*) increase perceived food palatability compared to words that facilitate outward mouth movement articulation (i.e., *kasopi*). This suggests that inward mouth movement articulation is not only

associated with the intake of food, but even enhances perceptions of the extent to which as food is desirable to eat. Note that the above-mentioned effects on taste related characteristics are all triggered by merely visual information.

Although these studies shed a light on the effects of embodiment on food evaluations, research on product packaging within this domain is scarce. A number of studies demonstrate effects of spatial cues on perceptions of brand personality and quality related outcomes (Peracchio & Meyers-Levy, 2005; van Rompay, de Vries, Bontekoe, & Tanja-Dijkstra, 2012) Furthermore, Becker, Van Rompay, Schifferstein and Galetzka (2011) demonstrated that packaging can affect the experience of taste. Specifically, these authors showed that an angular packaging shape of a dairy product result in a more intense product taste experience compared to a round packaging shape – but only for participants who have high trait sensitivity for design (Becker et al., 2011). Although these studies demonstrate the effects of subtle packaging design cues and orientation cues on product attribute perception, no research to date has investigated how product healthiness can be communicated by subtle packaging cues. Based on embodiment accounts, we propose that shape may serve as a metaphor to induce healthiness perceptions.

3.3.2 Package shape and healthiness perception

The concept healthiness is strongly associated with body shape. There are several ways in which healthiness can be quantified based on spatial bodily characteristics. For instance, restricted by certain boundaries, a lower ratio between body circumference and length is associated with greater health (Bergman et al., 2011). A lower waist-to-hip ratio (from here: hourglass shape) is associated with increased health in women (Singh, 1993; Singh, 2002) and also in men (though to a lesser degree, see Welborn, Dhaliwal, & Bennett, 2003). Thus, healthiness is interpreted and understood in terms of (bodily) spatial characteristics. Based on the Perceptual Symbol Systems account (Barsalou, 1999; Barsalou, 2008; Lakoff & Johnson, 1999), we propose that healthiness is also interpreted in terms of shape in other contexts, such as product packaging. Specifically, we predict that shape is used to assess the concept of healthiness when consumers perceive (packaging of) products. We propose that these inferences affect perception of product packaging. As a result, package shape becomes a symbolic cue for product healthiness. The use of phrases such as *fitness* or *being fit* (i.e., *being healthy, but also 'fitting' in something*) reflects the existence of such a metaphoric relation.

Since a lower ratio between body circumference and length, as well as an hourglass shape is associated with healthiness in humans, we simulate body shape by varying the width-to-height ratio and degree of hourglass shape of package bottles. Hence, we predict that package shape communicates healthiness by simulating a healthy vs. unhealthy body shape.

H1: Consumers associate shapes with bodily health such that products with a long, slim package shape are expected to be healthier and are expected to contain a lower amount of calories compared to products with a wide, short package shape.

3.3.3 The role of goal relevance

Goal dependent effects

We propose that packaging shape is a symbolic cue for healthiness. Similar to general multi-attribute type of models, which predict that the impact of a certain belief increases with the extent to which it is relevant (“important”) in a certain context, we propose that such cues will only impact consumer evaluation and choice if they are relevant to the consumer in a particular context. In other words, even if products with a slim package shape are perceived as healthier, they would only be preferred if consumers attach relevance to product healthiness.

This notion is consistent with literature on the activation of (automatic) processes, which suggests that their impact is moderated by motivations and goals. For instance, according to Bargh (1989), unintended automaticity can be goal dependent and often only emerges when the cue is goal relevant (Irmak, Vallen, & Robinson, 2011; Macrae, Bodenhausen, Milne, Thorn, & Castelli, 1997; Niedenthal, Winkielman, Mondillon, & Vermeulen, 2009). Karremans, Stroebe and Claus (2006) for example found that a very short– subliminal – presentation of soda brand cues only affected participants’ consumption behaviour when they were thirsty (i.e., a drinking-goal was activated). Although packaging shape is not a cue that is often perceived subliminally, we believe that, because of the unobtrusive, implicit nature of this cue, it will render similar results as for subliminal priming (see also Chartrand, 2005). We therefore propose that consumers are only responsive to symbolic cues that are associated with healthiness when these cues are relevant for the consumer’s shopping goal: That is, health-related cues like a long shaped package may be used as a cue to evaluate the qualities of a product when consumers have a relevant, health goal (i.e., focused more on functional, necessary characteristics), but not when they have an irrelevant, hedonic goal (i.e., focused on the pursuit of (short-term) sensory pleasure, cf. Belei et al., 2012; Chernev, 2004).

H2: A slim package shape (vs. a wide package shape) increases product attitude for consumers who have a healthiness goal, but not for consumers who have a hedonic goal.

H3: A slim package shape (vs. a wide package shape) increases product choice for consumers who have a healthiness goal, but not for consumers who have a hedonic goal.

Goal directed behaviour: The role of attention

If package shape would function as a symbolic cue for healthiness, products with a slim shape should help to identify healthy products. More specifically, products with a slim package shape would grab more attention and therefore enhance the recognition of the product on the shelf compared to products with a wide package shape. Indeed, it has been demonstrated that salient visual information only directs attention when its characteristics match an active task, and not when they are task irrelevant (Folk, Remington, & Johnston, 1992).

Goal-dependency effects also occur when the visual cue is symbolic. For instance, Eimer (1997) found that participants automatically use relevant symbolic cues (i.e., arrows) to identify the position of a target object, even if these cues turn out to be misleading. Furthermore, as demonstrated with spatial cueing paradigms, the task goal of detecting a target stimulus results in an attention focus on the defining characteristics of the target, even if these characteristics are present in unrelated stimuli (Folk et al., 1992; Vogt, De Houwer, & Moors, 2015). These results demonstrate that an attention focus on goal relevant stimuli occurs automatically and without intention. Until now however, knowledge on the interaction between goal directed behaviour and attention to symbolic visual cues in a retail context is lacking. Especially in a retail environment it is likely that package cue perception is affected by contextual cues such as packaging attributes or other products and brands – while this is not the case in a spatial cueing paradigm. We therefore investigate to what extent package shape (slim vs. wide packaging) functions as an automatic healthiness cue by measuring on-shelf identification time of a product that is advertised as healthy.

H4: A slim (vs. wide) package shape increases on-shelf recognition for products that are advertised as healthy, but not for products that are advertised as hedonic.

3.4 Overview of studies

Study 1 serves as a pre-test, in which we show that different degrees of packaging shape (i.e., width-to-height ratio and hourglass shape) alter expectations of a product's healthiness (H1). In studies 2 and 3, we show with experiments that consumers have different healthiness associations with a brand when its packaging simulates a slim opposed to a wide body shape (H1). In addition, we show that package shape affects evaluative outcomes (i.e., product attitude and choice) only when the shopping goal is relevant for the shape cue. That is, we demonstrate that slim package shape increases product evaluations when consumers adopt a healthiness goal, but does not affect evaluations when consumers have a hedonic goal (H2 and H3). To test the general underlying mechanism of the effects, Study 4 demonstrates with an implicit association task that longer, vertical shapes are associated more with a healthy human body compared to wider, horizontal shapes. Enhancing the practical relevance and replicating results from Studies 1 - 3, we use a larger, authentic product set in a realistic shopping environment in Study 5. In addition, Study 5 demonstrates that a slim package shape increases on-on-shelf recognition (product recognition) for products advertised as healthy (H4).

3.5 Study 1 (pre-test)

3.5.1 Participants and design

In Study 1, we investigated the extent to which packaging shape affects perception of the concept healthiness⁵. Furthermore, in view of the associations between product healthiness and tastiness that have been found in the past (e.g., Liem et al., 2012; Raghunathan, Naylor, & Hoyer, 2006), we tested the possibility that packaging shape also affected expected tastiness. In order to test this, we adopted a single factor repeated measures design with shape (slim, medium, wide) as within subjects factor, and product category (drink yoghurt, salad dressing) and shape cue (width-to-height ratio, hourglass) as within subject replicator factors. Thirty-seven student participants filled in the questionnaire, and received a financial compensation or a partial course-fulfilment for their participation afterwards.

3.5.2 Stimuli and procedure

The participants were presented with bottles for drink yoghurt and salad dressing that were designed Using Adobe Photoshop CS6 (Figure 3.1). Width-to-height ratio was manipulated by increasing a typical bottle (medium condition) with 10% in width and decreasing it with 15% in height (wide condition), or the other way around (slim condition). In the hourglass conditions, shape was manipulated by altering the ratio between the width of the bottom and the width of the middle of the bottle to .7 (slim), .8 (medium), or .9 (wide condition). To indicate that all bottles contained the same amount of Millilitre product, we placed a clear volume indication on the right bottom of the bottles (350 ml).

We instructed participants *"We would like to know to what extent you associate certain product properties with different kinds of product packages. The focus is on your intuitive, primary response and not on you rational thoughts"*. For both product categories, participants were presented with the range of product bottles (slim, medium and wide) in the middle of the screen, and indicated on a 2-dimensional scale to what extent they felt that the packaging communicated a low amount of fat per millilitre product (1) to a high amount of fat per millilitre product (7), and little flavour (1) to much flavour (7). For each shape variant, participants answered the questions on a different page. The sequence of the bottles (e.g., slim, medium, wide), as well as the sequence of product categories (drink yogurt, salad dressing) was randomly presented.

3.5.3 Results

We consistently found effects of the width-to-height and hourglass manipulations on the expected amount of fat in the product. The width-to-height manipulation had a positive linear effect on expected amount of fat for the drink yogurt packaging ($M_{slim} = 3.30$, $SD = 1.41$; $M_{medium} = 4.11$, $SD = .91$; $M_{wide} = 5.03$, $SD = 1.42$),

⁵ Part of these results were presented in the conference proceedings of the EAA; van Ooijen, I. (2016). The Power of Symbolic Packaging Cues. In *Advances in Advertising Research (Vol. VI)* (pp. 365-378). Springer Fachmedien Wiesbaden.

$F(1, 36) = 22.48, p < .0001, \text{partial } \eta^2 = .38$, and this was also the case for the salad dressing packaging ($M_{\text{slim}} = 3.49, SD = 1.39; M_{\text{medium}} = 4.16, SD = .65; M_{\text{wide}} = 4.68, SD = 1.53$), $F(1, 36) = 7.00, p = .012, \text{partial } \eta^2 = .16$. Thus, the medium packaging was associated with a higher amount of fat than the slim packaging, and the wide packaging was associated with a higher amount of fat than the medium, and the slim packaging.

We found a similar result for the hourglass manipulation, which had a linear effect on expected amount of fat for both the drink yogurt packaging ($M_{\text{slim}} = 3.24, SD = 1.07; M_{\text{medium}} = 3.89, SD = .70; M_{\text{wide}} = 4.70, SD = 1.31$), $F(1, 36) = 29.40, p < .0001, \text{partial } \eta^2 = .45$, and the salad dressing packaging, ($M_{\text{slim}} = 3.00, SD = 1.11; M_{\text{medium}} = 4.22, SD = 1.16; M_{\text{wide}} = 4.84, SD = 1.42$), $F(1, 36) = 21.63, p < .0001, \text{partial } \eta^2 = .38$.



Figure 3.1 Stimulus materials for the width-to-height and hourglass manipulations used in Study 1. Wide, medium, and slim are depicted from left to right for the product category salad dressing.

Interestingly, for both the shape manipulations, none of the contrasts was significant for the taste expectations, indicating that a slimmer vs. wider package shape did not affect taste expectations of the product (See Appendix A for the contrasts for amount of fat and taste expectations). Thus, a slim vs. wide package shape is associated with healthiness, but does not affect tastiness associations.

In the following studies, we will investigate whether the association between packaging shape and healthiness results in goal-dependent product evaluations. To assess whether package shape affects consumer evaluations dependent on the consumer's goals, we therefore manipulated goal relevance in Studies 2 and 3 by using a health-relevant goal condition, as well as an irrelevant (hedonic) goal condition. Hence, we investigated whether package shape affects product evaluations when consumers have a healthiness goal, but not when they have a hedonic goal. We tested this for two product categories (i.e., salad dressing and drink yogurt), and for two varieties of body shape simulation – Study 2 tested the effects of width-to-height ratio of packaging on product evaluations, and Study 3 tested the effects of hourglass shape of packaging on product evaluations.

3.6 Study 2

3.6.1 Participants and design

In Study 2, we investigate the extent to which packaging shape affects healthiness perception, and affects product attitude and product choice under different consumer goals. In order to test this, we adopted a 2 x 2 mixed design with goal (health-relevant, health-irrelevant) as between subjects factor, package shape (slim, wide) as within subject factor, and product category (drink yoghurt, salad dressing) as between subject replicator factor⁶. One hundred-ninety-six student participants (80% female, $M_{\text{age}} = 22.8$) filled in the questionnaire, and received a financial compensation or a partial course-fulfilment for their participation afterwards.

3.6.2 Stimuli and procedure

The participants were presented with two brands of drink yoghurt or salad dressing that were designed Using Adobe Photoshop CS6. As in Study 1, width-to-height ratio was manipulated by increasing a typical bottle (medium condition) with 10% in width and decreasing it with 15% in height (wide condition), or the other way around (slim condition). To indicate that all packages contained the same amount of product, we mentioned the volume indication on the right bottom of the packaging (350 ml). The brand names Covent Garden vs. Hidden Valley, Marzetti's vs. Cardini's (salad dressing), and Bonleche vs. Bonlait and Yolait v.s. Yoveve (drink yogurt) were randomly allocated to label either the slim or wide package. Furthermore, product position (left or right) was randomized between subjects.

Goal was manipulated by inducing either a health-relevant goal or a health-irrelevant (hedonic) goal for consumption. As a goal manipulation, participants in the health-relevant goal condition read the following scenario:

"During the holidays you gained weight, and therefore you decided to eat healthier. This means eating no products that make you gain weight, but light products with little calories. You decide to go to the supermarket to buy some yogurt drink / salad

⁶ As expected, there were no interaction effects between the replicator factor product type (salad dressing vs. drink yogurt), and the goal and shape manipulations. Thus, the effects applied to both product categories, and therefore are not further reported.

dressing. Several types of yogurt drink / salad dressing are sold. You are looking for a healthy product. You walk to the dairy / dressing shelf, and see these two brands of yogurt drink / salad dressing"

Participants in the health-irrelevant goal condition read the following scenario:
"After a morning / day of hard work you deserve a break / tasty dinner – you've earned it. You feel like having something tasty / a tasty salad and decide to go to the supermarket to buy some yogurt drink / salad dressing. Several types of yogurt drink / salad dressing are sold. You are looking for a product with a tasty, full flavour. You walk to the dairy / dressing shelf, and see these two brands of yogurt drink / salad dressing"

Participants were randomly presented with the two brands from one of the product categories, where one brand was always a slim version and the other brand the wide version. Subsequently they indicated their product choice on a 6-pt scale ranging from -2.5 to 2.5 (-2.5 = *almost certainly product X*; -1,5 = *probably product X*; -0.5 = *inclination to product X*; 0.5 = *inclination to product Y*; 1,5 = *probably product Y*; 2.5 = *almost certainly product Y*).

Healthiness was measured using the items (based on Provencher, Polivy, & Herman, 2009) *"How much does this product fit within a healthy eating style?"* and *"How healthy do you expect product X to be?"* (1 = not at all, 8 = very much; Cronbachs Alpha = .82). Moreover, calorie estimation was measured using a slider scale, where participants indicated the number of calories that they expected the product to contain, ranging from the realistic amount of 20 to 60 Kilocalories per 100 Millilitre product.

Product attitude was measured using four items on a 5-pt semantic differential scale, measuring the dimensions *poor-good*, *unappealing – appealing*, *unattractive – attractive*, *uninteresting – interesting* (Chang & Thorson, 2004, Cronbachs Alpha = .87).

3.6.3 Results

Healthiness expectations

To test the hypothesis that a slim package shape increases healthiness associations, we conducted a 2 x 2 Mixed Model ANOVA with goal (health-relevant, health-irrelevant) as between subject factor and shape (slim, wide) as within subject factor. In line with our predictions, we found a strong effect of shape on expected healthiness. A product was expected to be healthier when it was packed in a slim bottle ($M = 4.80$, $SE = .08$) compared to when it was packed in a wide bottle ($M = 3.81$, $SE = .08$), $F(1, 194) = 93.80$, $p < .001$, partial $\eta^2 = .33$. Furthermore, participants expected the amount of calories to be lower when the product was packed in a slim bottle ($M = 40.53$, $SE = .69$) than when it was packed in a wide bottle ($M = 47.25$, $SE = .80$), $F(1, 194) = 110.79$, $p < .001$, partial $\eta^2 = .36$.

Unexpectedly, there was a small effect of goal on expected healthiness. $F(1, 194) = 6.82$, $p = .01$, partial $\eta^2 = .03$. Participants that had a health-irrelevant shopping

goal rated the product as slightly less healthy ($M = 4.14$, $SE = .09$) compared to participants who had a health-relevant goal ($M = 4.46$, $SE = .09$). In line with our predictions, this was not the case for the expected amount of calories ($p > .05$). As predicted, we found no interaction effect between goal and package shape on healthiness perceptions. ($p > .05$)

Brand choice

Likelihood of choosing the slim product was calculated from a 6-pt scale ranging from -2.5 to 2.5, where negative values indicate choice for brand A (-2.5 = "certainly brand A", -1.5 = "most likely brand A", -0.5 = "inclination towards brand A), while positive values indicate choice for brand B (0.5 = "inclination towards brand B", 1.5 = "most likely brand B", 2.5 = "certainly brand B). The brand with a slim vs. wide packaging was randomly assigned to brand A or brand B. A one way ANOVA with goal (health-relevant, health-irrelevant) as between subject factors showed that, regardless of brand name, goal affected the likelihood that the slim bottle was chosen, $F(1, 192) = 26.19$, $p < .001$, partial $\eta^2 = .12$ (Figure 3.2). As expected, there were no differences between the product types, $p = .151$. When the goal was health-relevant, the likelihood that the slim product was chosen was higher ($M = 1.20$, $SD = 1.03$) than when the goal was health-irrelevant ($M = .05$, $SD = 1.03$).

To investigate whether choice was affected in the relevant goal and irrelevant goal conditions separately, two t-tests were conducted for each goal condition. When the goal was irrelevant, shape did not affect product choice, $p = .70$. When the goal was relevant however, shape did affect product choice, $p < .001$. Thus, in line with our expectations, width-to-height ratio affected choice when consumers had a health-relevant goal, and not when they had an irrelevant, hedonic goal.

Product attitude

A 2 x 2 mixed design ANOVA with goal (health-relevant, health-irrelevant) as between subject factors, and shape (slim, wide) as within subject factor revealed, as expected, a significant interaction effect between shape and goal, $F(1, 194) = 5.61$, $p = .019$, partial $\eta^2 = .03$, indicating that the attitude towards slim vs. wide was dependent on the shopping goal (See Figure 3.2). A simple slopes analysis showed that, while a slim shape positively affected product attitude in the health-relevant condition ($M_{slim} = 3.40$, $SD_{slim} = .09$, $M_{wide} = 2.66$, $SE_{wide} = .09$, $p < .001$), shape affected attitude far less in the health-irrelevant goal condition ($M_{slim} = 3.35$, $SE_{slim} = .08$; $M_{wide} = 3.00$, $SD_{wide} = .08$, $p = .002$). Not germane to our hypotheses, there was also a significant main effect of shape on attitude $F(1, 194) = 44.40$. $p < .001$, partial $\eta^2 = .19$ ⁷.

⁷ Compared to a health-irrelevant goal, a health-relevant goal only affected attitude for brands with a wide bottle ($p < .001$, $B = .20$). This suggests that particularly the decreasing attitude towards the wide packaging may affect product choice (i.e., an avoidance of wider packaging). This was investigated with a mediation analysis (Hayes, model 4). Indeed, goal affected choice through a decreased attitude towards the wide packaging, $CI = [.09 - .48]$, $B = .26$, and not via an increased attitude towards the slim packaging, $CI = [-.14 - .18]$.

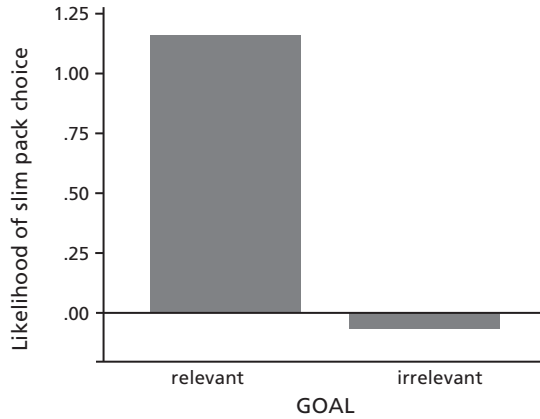


Figure 3.2a Likelihood of slim pack choice in Study 2, where -3 indicates certain choice for a product with a wide package, while 3 indicates certain choice for a product with a slim package. Package shape only affected product choice when the goal was health-relevant, $p < .001$.

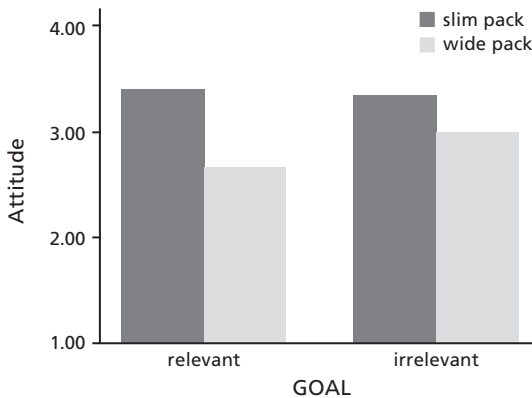


Figure 3.2b Attitude towards the product (5-pt scale) for Study 2. When the goal was health-relevant, attitude towards the product with a slim pack was more positive compared to attitude towards the product with a wide pack. This effect was far less pronounced in the health-irrelevant condition, $p(goal \times shape) = .019$.

3.7 Study 3

3.7.1 Participants and design

In Study 2 we found that width-to-height ratios of packaging affects product healthiness perception, and affects product attitude and choice under different consumer goals. The aim of Study 3 is to replicate these results, now using an hourglass manipulation to simulate body shape. In order to test this, we adopted a 2×2 mixed design with goal (health-relevant, health-irrelevant) as between subjects factor, package shape (slim, wide) as within subject factor, and product category (drink yoghurt, salad dressing) as between subject replicator factor. Ninety-one student participants (77% females, $M_{age} = 21.5$) filled in the questionnaire, and

received a financial compensation or a partial course-fulfilment for their participation afterwards.

3.7.2 Stimuli and procedure

The participants were presented with product bottles for drink yoghurt and salad dressing that were designed Using Adobe Photoshop CS6. Hourglass shape was manipulated by altering the ratio between the width of the bottom and the width of the middle of the bottle to .7 (slim condition) or .9 (wide condition; see Study 1). These ratios correspond to body shapes that are considered as healthy/attractive (.7) and unhealthy/unattractive (Singh, 1993; Singh, 2002). To indicate that all packages contained the same amount of Millilitre product, we placed a volume indication on the right bottom of the packaging (350 ml). The brand names Covent Garden vs. Hidden Valley, Marzetti's vs. Cardini's (salad dressing), and Bonleche vs. Bonlait, and Yolait v.s. Yoveve (drink yogurt) were randomly allocated to label either the slim or wide package. The procedure and goal manipulations were similar to Study 3.

3.7.3 Results

Healthiness expectations

In line with our predictions, a 2 x 2 Mixed Model ANOVA with goal (health-relevant, health-irrelevant) as between subject factor and shape (slim, wide) as within subject factor showed that shape affected expected healthiness, $F(1, 89) = 21.15$, $p < .001$, partial $\eta^2 = .19^8$. A product was expected to be healthier when it was in a slim bottle ($M = 5.15$, $SE = .14$) compared to when it was packed in a wide bottle ($M = 4.31$, $SE = .14$). Furthermore, participants expected the amount of calories to be lower when the product was packed in a slim bottle ($M = 41.92$, $SE = .71$) than when it was packed in a wide bottle ($M = 46.72$, $SE = .74$), $F(1, 89) = 26.20$, $p < .001$, partial $\eta^2 = .23$. As predicted, there was no effect of goal on expected healthiness, $F(1, 89) = 2.57$, $p = .11$. This was neither the case for the expected amount of calories, $F(1, 89) = .31$, $p = .58$.

Brand choice

Likelihood of choosing the slim product was calculated from a 6-pt scale ranging from -2.5 to 2.5, where negative values indicate choice for brand A (randomly wide or slim; -2.5 = "certainly brand A", -1.5 = "most likely brand A", -.5 = "inclination towards brand A), while positive values indicate choice for brand B (randomly wide or slim; 0.5 = "inclination towards brand B", 1.5 = "most likely brand B", 2.5 = "certainly brand B). A one way ANOVA with goal as between subject factor showed that goal affected the likelihood that the brand with the slim bottle was chosen, $F(1, 89) = 6.34$, $p = .01$, partial $\eta^2 = .07$. When a health-relevant goal was activated, the likelihood of choosing the slim product was higher ($M = .82$, $SD = 1.42$) than when the goal was health-irrelevant ($M = .05$, $SD = 1.52$).

⁸ As expected, there were no interaction effects between the replicator factor product type (salad dressing vs. drink yogurt), and the goal and shape manipulations. Thus, the effects applied to both product categories, and therefore are not further reported.

To investigate whether choice was affected in the health-irrelevant goal condition at all, two separate t-tests were conducted for each goal condition. When the goal was health-irrelevant, the effect of shape on product choice was not different from chance level, $p = .84$. When the goal was health-relevant however, there was a significant preference for the brand with a slim package (Mean Difference = .82), $p < .001$. Thus, the hourglass shape affects product choice when consumers have a health-relevant goal, and not when they have a health-irrelevant goal.

Attitude

A 2 x 2 Mixed Model ANOVA with goal (health-relevant, health-irrelevant) as between subject factor and shape (slim, wide) as within subject factor revealed a significant main effect of shape on attitude $F(1, 89) = 33.19$. $p < .001$, partial $\eta^2 = .27$. Independently from the goal manipulation, the slim pack was evaluated more positively ($M = 3.59$; $SE = .08$) than the wide pack ($M = 2.91$; $SE = .09$). Unlike we expected, there was no significant interaction effect between shape and goal, $F(1, 89) = .14$, $p = .71$, partial $\eta^2 = .002$. This indicates that, despite the increased choice for the slim pack, the attitude towards the wide vs. slim pack was not dependent on the shopping goal.

3.8 Study 4

In Studies 1, 2 and 3 we found that for packaging, variations in width-to-height ratio and hourglass shape affect healthiness perceptions, and affects product evaluations and choice when consumers have a healthiness goal. Based on embodiment accounts, we expect that this is the case because these packages are unconsciously associated with a healthier body shape. To formally test for this assumption, we investigated the association between bodily health and basic shape cues (i.e., horizontal versus vertical cues) using an Implicit Association Test (Greenwald, McGhee, & Schwartz, 1998).

3.8.1 Method

Twenty-two participants (73% female; Mean age 25.71) were invited to participate at the University, and received a financial compensation or course credits for participation. We used an implicit association test to measure the implicit association between spatial cues and bodily health. Participants were asked to classify words related to bodily health (e.g., slim, fit, vital; chubby, disease, sickness) and 'horizontal and 'vertical' spatial cues using two response keys in congruent and incongruent blocks (See Appendix B). In the congruent block, participants categorized eight words related to 'healthy body' and four vertical cues (indicated as 'long') with the right key, and eight words related to 'unhealthy body' and four horizontal cues (indicated as 'wide') with the left key. In the incongruent block, participants categorized eight words related to 'healthy body' and four horizontal cues with the right key, and eight words related to 'unhealthy body' and four 'vertical' cues with the left key. Every block with 40 trials was preceded by a practice block with 20 trials. The between participant randomization of the stimuli, blocks and response keys were similar as in (Greenwald et al., 1998).

3.8.2 Results

Shorter response latencies in the congruent (healthy body – vertical cues and unhealthy body – horizontal cues) than the incongruent blocks (healthy body – horizontal cues and unhealthy body – vertical cues) were interpreted as a stronger association between vertical cues and ‘healthy body’ and horizontal cues and ‘unhealthy body’.

The strength of the association between concepts was measured by the standardized mean difference score of the incongruent pairings and the congruent pairings (*d*-score). For this, we used the improved scoring algorithm developed by Greenwald, Nosek and Banaji (2003). Whereas a negative score indicates an association between the incongruent pairings, a positive score indicates an association between the congruent (hypothesized) pairings. Indeed, a t-test demonstrated that the *d*-score was significantly different from zero, $t(21) = 2.51, p = .020, d_{mean} = .28, SD = .53$. A Repeated Measures ANOVA indicated that participants had longer latencies in the incongruent blocks ($M = 900.69, SD = 49.02$) than in the congruent blocks ($M = 771.72, SD = 39.61$), $F(1, 21) = 11.42, p = .003$, partial $\eta^2 = .35$. This indicates that individuals associate a healthy body more with vertical cues, while they associate an unhealthy body more with horizontal cues. These results confirm the notion that slimmer abstract shapes are associated more with a healthy body, while wider abstract shapes are associated more with an unhealthy body. Thus, the results are in line with our notion that slim product shapes increase healthiness associations of products because consumers associate product shape with body shape.

3.9 Study 5

In Study 5, we increased the practical relevance by using larger choice sets in a virtual environment that closely represents a real-life shopping environment. Furthermore, we increased external validity by using population samples that are representative of consumers in general. Besides replicating results from Studies 2-3, we measured whether on-shelf recognition increased for slim packs when consumers had a health-relevant goal, and whether this enhanced recognition increased product attitude in turn using a 2-factor between subjects design.

3.9.1 Participants and design

We investigated the extent to which width-to-height ratio of product packaging affected healthiness perception, product attitude, and product recognition on the shelf under different consumer goals. In order to test this, we adopted a 2 x 2 between subjects design with goal (health-relevant, health-irrelevant) and package shape (slim, wide) as between subjects factors, and brand (brand A, brand B) as between subject replicator factor. Two-hundred-eleven consumers who had bought drink yogurt in the past three months and ranged from 18 to 60 years (53% female) participated via a participant recruitment company.

3.9.2 Stimuli and procedure

The experiment was conducted using Simstore 360° software, a professional software program that is used by many consumer goods brands to test (new or changed) package designs in a realistic environment. The software allowed us to visualize a very realistic point of sale interface, using product shelves.

In the first part of the task, participants received the goal manipulation by being presented with a product slogan that appealed to either healthiness or hedonic related qualities of a drink yogurt brand. In the health-relevant condition, participants read the slogan “[Brand] is a lovely light dairy drink with a minimum amount of sugar and fat” while participants in the health-irrelevant condition read “[Brand] is a lovely sweet dairy drink with a creamy and full flavour”. Subsequently they were asked to “find and buy this brand of drink yogurt (the ‘target product’) on the product shelf as fast as possible by clicking on it”. The target brand (Yoggi Banana Mango Orange or Ica Peach) was randomized between subjects.



Figure 3.3 Product stimuli used in Study 5. The target product (“Yoggi Banana Mango Orange” or “ICA Drink yogurt Peach”) was presented between subjects as either a slim or wide version, after participants received the goal manipulation.

The search task started immediately after participants clicked on a start button in the lower middle of the screen. Participants were presented with the product shelf containing 26 genuine, foreign brands of drink yogurt, including the target brand (See Figure 3.3). We chose for foreign brands to rule out the possibility that participants were already familiar with the products, which could affect their evaluations of the target product. The shape of the target product on the shelf was manipulated between subjects by altering the width-to-height ratio of the bottles, while keeping the corresponding volume constant. A high width-to-height ratio represented a slim body shape, while a low width-to-height ratio represented a wide body shape. Participants selected the product for purchase by clicking on it, which revealed a 'buy' button where participants clicked on to purchase the product. After participants purchased the product, they were directed to the second part of the experiment, where they answered several questions. Healthiness association was measured using the items (based on Provencher, Polivy, & Herman, 2009) "How much does this product fit within a healthy eating style?" and "How healthy do you expect product X to be?" (1 = not at all, 8 = very much; Cronbach's Alpha = .84). Moreover, calorie estimation was measured by letting participants type in the number of Kilocalories that they expected the product to contain, within the realistic 20 to 60 Kcal per 100 millilitre interval. Subsequently product attitude was measured using four items on a 7-pt semantic differential scale, measuring the dimensions poor-good, unappealing – appealing, unattractive – attractive, uninteresting – interesting (Chang & Thorson, 2004, Cronbach's Alpha = .92).

3.9.3 Results

On-shelf recognition of the target brand

We were interested whether package shape would be an intuitive cue that helps consumers to select healthy products. Therefore, we investigated whether consumers use width-to-height ratio as a metaphoric cue to identify healthy products. We measured this as on-shelf recognition: the time it takes participants to identify the target brand by clicking on it. Note that lower values of this variable indicate higher on-shelf recognition. To correctly measure on-shelf recognition, we only included participants from our sample that correctly selected the target product in their first attempt, resulting in a sample of 144 participants. Furthermore, we removed four participants with unusual long response times ($ZRE > 2.5$) from the sample. This did not change the significance of the results.

Not germane to our hypotheses, participants took longer to identify a product when the package was wide ($M = 40.11$; $SD = 15.55$) opposed to slim ($M = 35.43$; $SD = 15.36$) and longer when they had a healthiness goal ($M = 40.29$; $SD = 16.02$) opposed to a hedonic goal ($M = 35.25$; $SD = 14.87$). More important for our hypothesis, these main effects were driven by an expected interaction effect between shape and goal, $F(1, 140) = 8.95$, $p = .003$, partial $\eta^2 = .06$. As expected, compared to wide packages ($M = 46.41$; $SD = 16.39$), slim packages ($M = 34.17$; $SD = 13.67$) decreased the time it took participants to identify the healthy target product, and thus increased the on-shelf recognition, $p = .001$. When the goal was to buy the health-irrelevant product, shape did not affect on-shelf recognition, $p = .43$ (See Figure 3.4).

Explicit healthiness association

Explicit healthiness association was measured using the variables estimated healthiness and estimated number of calories. We did not find any effect of package shape on explicit healthiness association, $p = .58$ or expected caloric value, $p = .61$. Furthermore, there was no effect of goal, and no interaction effect between goal and shape on expected caloric value.

Interestingly, participants did not explicitly report that they found products in slim packages healthier, while a behavioural measurement (i.e., on-shelf recognition) indicated that package shape was, perhaps unconsciously, used as a cue to identify healthy products. To investigate whether there is a relation between the explicit association and the behavioural measurement on-shelf recognition, we tested whether participants' explicit healthiness judgments moderated the extent to which they used package shape as a cue to identify the healthy product. A simple slopes (spotlight) analysis (Spiller, Fitzsimons, Lynch Jr, & McClelland, 2013) showed that participants were faster to identify the healthy brand when its package was slim opposed to wide, even when participants self-reported healthiness association was low (See Table 3.1). However, the effect of package shape of healthy products on on-shelf recognition products was relatively stronger for participants who afterwards indicated that the product looked healthy. These findings suggest that, although participants may not be explicitly aware of the association between package shape and healthiness, they do use shape as a cue to identify healthy products.

Explicit Association	PCTL	B	se	t	p	LLCI	ULCI
3.0	10 th	-9.89	5.37	-1.84	.041	-20.60	.82
3.5	25 th	-11.08	4.15	-2.67	.003	-19.36	-2.80
4.0	50 th	-12.27	3.62	-3.39	.003	-19.49	-5.05
4.5	75 th	-13.46	4.06	-3.32	.007	-21.55	-5.36
5.0	90 th	-14.64	5.23	-2.80	.043	-25.07	-4.21

Table 3.1 Effects of the goal X shape interaction on on-shelf recognition, for values of explicit healthiness association at the 10th, 25th, 50th, 75th, and 90th percentiles.

Attitude

As expected, there was a significant interaction effect between shape and goal on attitude, $F(1, 207) = 4.69$, $p = .032$. A brand with a slim package was evaluated more positive ($M = 4.04$; $SD = 1.09$) than a brand with a wide package ($M = 3.39$; $SD = 1.22$) when participants had a health-relevant goal, $p = .010$, while packaging shape did not affect attitude when participants had a health-irrelevant goal, $p = .65$. In line with our expectations, we found no significant main effects of shape, $F(1, 207) = 2.28$, $p = .133$, or goal, $F(1, 207) = .22$, $p = .64$, on attitude (See Figure 3.4).

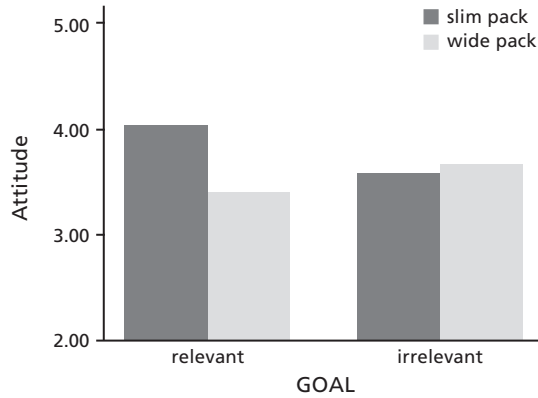


Figure 3.4a Target identification time on the shelf in seconds. Participants identified products faster when packaging was slim compared to wide when the goal was health-relevant, and not when it was irrelevant, $P(\text{goal} \times \text{shape}) = .038$.

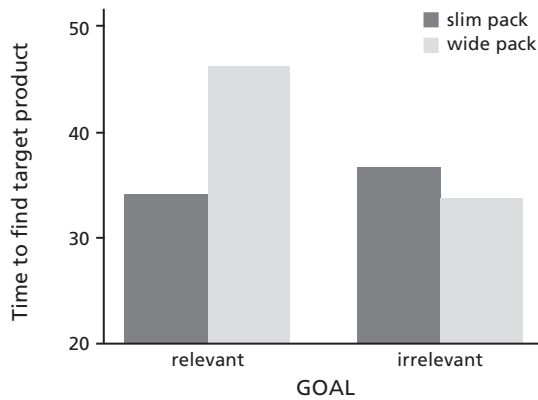


Figure 3.4b Attitude towards the product (7-pt scale) for study 5. A slim pack relatively increased product attitude compared to a wide pack, but only when the goal was health-relevant, $P(\text{goal} \times \text{shape}) = .032$.

3.10 General discussion

The results of three studies support the notion that packages that simulate body shape act as a symbolic cue for healthiness (H1). Our results strongly suggest that slimmer packages result in increased healthiness perception because consumers associate those packages more with healthy human body shapes. When choosing between two products, participants chose more often for a brand with slim package, and showed a more positive attitude towards these products. This was only the case, however, when the shape cue was goal relevant (i.e., when the goal was to buy a healthy product, and not a tasty product; H2). Furthermore, when a brand was first framed as healthy, participants were afterwards faster to identify this brand on the shelf when its package was slim, compared to when it was wide. When the slogan appealed to the hedonic qualities of the product however, package shape did not

affect on-shelf recognition – the cue was not relevant here (H3). The same effect applied to the attitude that consumers had towards the advertised product.

These effects also hold when consumers do not make a direct comparison between products with different shapes, but evaluate a single (slim vs. wide) product, as shown in Study 5, although it should be noted that package shape did not have an effect on explicit measures of healthiness (this aspect of our findings will be addressed further in our limitations section). This is the first study that investigates how package shape can be used to promote healthy products by increasing healthiness perceptions. As such, this study has important implications for food brands, NGOs and policy makers who seek to nudge consumers toward choosing more healthy options. Our findings show that choosing a packaging shape that implicitly communicates a product's health benefits (i.e., a "slim" package for a product with less fat) helps convey these benefits to consumers.

Second, we show that these effects are dependent on the goal of the consumer. While simulations of body shape are effective package cues when health related qualities of a product are evaluated, these cues are uninformative when hedonic qualities of a product are assessed. Our results show that simulating a healthy body shape is only a relevant cue for product evaluation when consumers have a health-relevant shopping goal. Moreover, we found that slim package shapes also affect behavioural outcomes such as evaluations and on-shelf recognition of products when consumers have a health-relevant goal, but not when they have a hedonic goal. The goal-dependency of our effect has important implications for their practical application: although we demonstrate that implicit health cues in packaging design may enhance product attitude and help consumers to find healthy products on the shelf, we only find these effects for consumers who have an active goal to eat more healthy. This means that our findings are most helpful in influencing consumers who are looking to improve their health by eating healthier. Implicit packaging cues seem less appropriate for nudging consumers to a healthier lifestyle. Our findings therefore suggest that these cues should be used in addition to other, more general campaigns that inform consumers about the benefits of a healthy lifestyle and persuade them to choose foods that are healthier. Implicit packaging cues can then help consumers to act according to these changed views, and realize their health goals.

From a theoretical perspective, our results are interesting because they counter a number of other studies that demonstrate a negative relationship between healthiness and tastiness (Laran & Wilcox, 2011; Liem et al., 2012; Raghunathan et al., 2006). While these studies found that explicit health information decreased expected or perceived tastiness of a product, the results of our study support the notion that relatively implicit (i.e., shape-) cues that communicate healthiness do not affect product evaluations when consumers have a hedonic consumption goal (i.e., focused on taste). In other words, our results indicate that there might not be a relationship between communicated healthiness and perceived tastiness when the healthiness cue is implicit. Further research should address to what extent a relationship exists between hedonic consumer goals and responsiveness to more implicit healthiness cues.

Interestingly, while package shape affected on-shelf recognition and product attitudes, it did not affect self-reported, explicit healthiness perception in Study 5. In other words, package shape affected on-shelf recognition and product evaluation for consumers who are looking for healthy products, but this was not reflected in increased explicit, conscious perceptions of healthiness. These findings may reflect the importance of unconscious processes that play a role in consumer behaviour, in particular for unobtrusive cues such as package shape in situations that represent real-life. Slim packaging increases product recognition on the shelf and increases product attitude only when consumers have a healthiness goal, however consumers may not consciously attribute healthiness to the packaging when healthiness is measured explicitly. This possibility was supported by a post-hoc analysis, in which we found that a slim packaging shape affected on-shelf product recognition and product attitude when a product was framed as healthy, regardless of explicit healthiness perception.

Other studies have indicated that package shape can automatically affect consumer judgment in other domains. For instance, the more elongated a product container is, the higher consumers tend to estimate container volume, and the lower is consumption on a subsequent occasion (Raghubir & Krishna, 1999; Wansink & Van Ittersum, 2003). In the present study, we controlled for volume by clearly indicating product volume in Millilitre. Therefore, it is unlikely that differences in perceived volume are responsible for the effects on product evaluation in this study.

In the present study, we investigated the effects of slim packaging design on consumers' healthiness perceptions and behaviour in a virtual environment with realistic product shelves, using actual brands and products. Since our goal was to focus on the effects of package shape, we used actual brands without additional product information and claims on their packs. Product claims and product information however, are important and often used package cues – especially for healthy and functional foods. Therefore, future research should extend our research by investigating how implicit product cues (i.e., shape) and explicit product cues (i.e., claims, nutrient information) interact to create product expectations and evaluations. This would be also relevant in the light of possible misuse of package shape to increase the false perception that a product is healthy, while it actually contains much sugar or fat. Perhaps, the effect of package shape on healthiness perception is moderated by the nature of other, explicit cues on the package (i.e., health vs. taste related claims). It could, for example, be the case that a slim package shape enhances the effect of explicit health- or nutrition claims, while a wide package shape decreases the effect of such claims. Addressing such questions is important, as packaging shape may moderate the extent to which explicit cues are effective.

Another limitation of our studies concerns the behavioural measurements. Although product preference and on-shelf recognition of products were measured, we measured no actual product purchase. Therefore, future research should examine how packaging shape affects actual purchase behaviour, or even product consumption (i.e., the amount of consumed product) under healthiness and hedonic consumer

goals. It could be that case, for instance, that consumers drink less of a product when it is packed in a wider (versus slimmer) bottle, when those consumers have healthiness goal. Also, only two product categories – drink yogurt and salad dressing – were used as stimuli in these studies. In general, these types of products are available in low-calorie variants as well as high calorie variants. Hence, these product types may be more ambivalent regarding existing healthiness associations, which may increase the role of packaging as a cue for healthiness. Therefore, a next step would therefore be to examine how packaging shape affects healthiness perception for products that are generally perceived as high or low in calories.

Our results show how unobtrusive shape cues can affect product perception, choice and evaluation, as well as recognition of healthy products on the shelf. Hence, these results stress the importance of cue relevance, which may have been recognized in psychology, but does not seem to be as salient in the package design process. Whereas some package cues may have detrimental effects on product purchase for some consumer segments (e.g., a wider product container for consumers who prefer low-fat products), this may not be the case of other consumer segments. Therefore, where prior research on packaging cues has often focused on how packaging cues affect quality perception as a general evaluative measure (i.e., regardless of consumer goals), the increased interest in healthy and functional products may ask for a shift towards a tailored approach in the package design process for healthy products in particular.

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3.12 Appendix A

Shape cue	Category	Amount of fat			Taste		
		<i>slim</i>	<i>medium</i>	<i>wide</i>	<i>slim</i>	<i>medium</i>	<i>wide</i>
Hourglass shape	<i>Yogurt drink M</i>	3.24 ^a	3.89 ^b	4.70 ^c	4.41 ^a	4.41 ^a	4.30 ^a
	<i>SD</i>	1.07	.70	1.31	1.32	1.09	1.31
	<i>Salad dressing M</i>	3.00 ^a	4.22 ^b	4.84 ^c	4.24 ^a	4.57 ^a	4.27 ^a
	<i>SD</i>	1.11	1.16	1.42	1.44	1.39	1.35
Width-to-height ratio	<i>Yogurt drink M</i>	3.30 ^a	4.11 ^b	5.03 ^c	4.49 ^a	4.46 ^a	4.16 ^a
	<i>SD</i>	1.41	.91	1.42	1.35	.84	1.30
	<i>Salad dressing M</i>	3.49 ^a	4.16 ^b	4.68 ^c	4.57 ^a	4.24 ^a	4.51 ^a
	<i>SD</i>	1.39	.65	1.53	1.28	.68	1.47

Table A1 Means and Standard Deviations for amount of fat estimation for different levels of shape. Means sharing the same superscript are not significantly different from each other ($p > .05$).

3.13 Appendix B

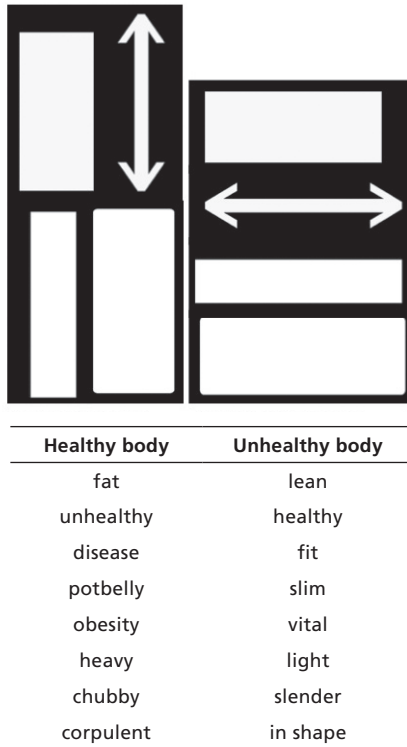


Figure B1 Target stimuli for the *horizontal* (top left) and *vertical* (top right) cue categories. Below, stimuli that represent the categories *healthy body* (bottom left) and *unhealthy body* (bottom right) are depicted. Stimuli were presented on a black computer screen.

4

Overruled by explicit cues?

4.1 Summary

In this chapter, we examine the interactive effect of packaging design and explicit packaging cues on product attribute perception of food products. Although the effect of explicit cues on product attribute perception has been studied extensively, systematic research on the effect of packaging design cues on product attribute perception is still in its infancy. Furthermore, it has never been investigated how design cues and explicit cues interact with each other in eliciting product attribute 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. Three studies demonstrate that consumers use packaging colour and shape as cues to infer product quality and healthiness. Furthermore, we examine how consumers make product attribute inferences when packaging design cues are congruent and incongruent with explicit cues. Based on Cue Consistency Theory (Maheswaran & Chaiken, 1991; Miyazaki, Grewal, & Goodstein, 2005) and information diagnosticity, we predict that packaging design cues only affect attribute inferences when congruent with explicit cues. Contrary to our expectations results indicate that overall, packaging design affects attribute inferences independently from explicit attribute cues. Furthermore, the effect of packaging design, relative to the effect of explicit attribute cues, seems to vary with the diagnosticity of explicit attribute cues.

4.2 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 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, Franssen, Verlegh, & Smit, 2016a). However, there is a lack of studies that examine how subtle packaging design cues, such as colour 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 and shape. The aim of this study is therefore to shed light on the interactive effects of packaging design and explicit attribute cues, and how congruence (versus incongruence) of these cues influences consumer decision-making.

In the present study, we therefore investigate 1) to what extent design cues are effective in changing product attribute perception, and 2) how design cues affect product attribute perception when explicit cues are available. In a series of experiments, we first replicate and extend former studies suggesting that packaging colour and shape affect quality and healthiness perception of food products. Secondly, we extend present knowledge by investigating how colour and shape cues affect attribute perception in the presence of congruent and incongruent explicit attribute cues: price, brand and product claims. 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, 2015). By addressing the effect of both packaging design and explicit attribute cues, and doing so in a comparative processing context, we significantly contribute to the limited knowledge that is available on packaging design effects and consumer behaviour.

4.3 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, 2016b), and logos (Steenhuis et al., 2010) have typically been studied as cues for product attributes, often in combination with more objective explicit attribute information. For instance, Mitra (1995) investigated the effect of quality cues in the presence of objective product information and found that the effectiveness of the quality cue price is dependent on the valence of objective information.

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 product attribute perception. In fact, subtle design cues such as shapes and colours affect product attribute inferences such as healthiness and quality perception and may influence consumer behaviour accordingly.

4.3.1 Implicit versus explicit packaging cues

As argued by Karjalainen (2007), design cues 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 (e.g., price, claims or brand), because they are not consciously perceived as cues that communicate brand attributes in a persuasive manner. Although consumers can be consciously aware of both explicit packaging cues and design cues (i.e., they are both visually perceivable), it is awareness of the persuasive effect of the cue wherein these cues differ (See also Chartrand, 2005). For instance, consumers consciously use product claims (explicit cue) on the packaging to assess product attributes. But also more ambiguous cues, such as price, can be considered as explicit attribute cues, since they are consciously used as an informational source for quality related attributes (Bagwell & Bernheim, 1996; Mitra, 1995; Rao, 2005). As argued by Rao (2005), consumers do so because such cues require little resources to process. This implies that, although cues such as claims, brand and price can be easy-to-process cues for product attributes, consumers still use them purposively to assess product value (Bagwell & Bernheim, 1996; 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 colours and shape connote a symbolic, abstract, and highly associative meaning (Underwood, 2003), but are not perceived as diagnostic sources for product attributes (Karjalainen, 2007; Spence, 2012), 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 (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 an implicit cue for product attributes.

4.3.2 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. The author coins these associations *cross-modal correspondences* as they involve associations between the modalities vision and taste. In a similar vein, angularity in packaging graphics has been shown to affect taste intensity and experiences of foods. Becker, Van Rompay, Schifferstein and Galetzka (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 cross-modal correspondences 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, Fransen, 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. (2016b) 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. Furthermore, slim packaging increases product evaluation and product recognition on the shelf when consumers have a healthiness goal. Moreover, with regard to quality perception, some exploratory studies indicate that colour may be effective to influence product attribute perception. For instance, a lower colour *brightness* of packaging is associated with higher quality expectations (van Ooijen, 2016) and ‘high-end’ product associations (Ampuero & Vila, 2006). Moreover, packaging colour hue is associated with taste inferences for some products, such as soda (i.e., colour intensity is associated with taste associations, Hine, 1995). However, note that these studies are of exploratory nature, as these findings rely on introspection and within subject designs.

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 and healthiness inferences – two types of inferences that have been studied extensively, but only as a consequence of explicit cues, such as prices or labels.

Colour as quality cue

Despite the large number of studies on the effect explicit cues (e.g., price) on quality perception (Mitra, 1995; Rao & Monroe, 1989; Rao, 2005; Shiv et al., 2005), only a limited number of studies have addressed the relationship between packaging colour and product quality perception. In general, there are a few studies that investigate the role of colour in creating product associations, and discussions on the use of colour are generally based on anecdotal evidence (Labrecque & Milne, 2012). Exploratory research has demonstrated that a negative association exists between colour brightness and quality perception (Ampuero & Vila, 2006; Van Ooijen, 2016). 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 colour brightness and quality perception. We predict that lower packaging colour brightness increases product quality perception. Furthermore, we predict that lower colour brightness will increase brand attitude, and inferences about the market position of the brand (i.e., low-end to high-end).

Shape as healthiness cue

Until recently, scholars have only studied the effect of explicit packaging cues, such as claims and logos, on healthiness inferences (Andrews, Netemeyer, & Burton, 1998; Hersey, Wohlgenant, Arsenault, Kosa, & Muth, 2013; Lee, Shimizu, Kniffin, & Wansink, 2013). However, besides explicit information on packaging, design cues may serve as a tool to enhance healthiness inferences about food products.

Van Ooijen, et al. (2016b), found that packaging shape affects healthiness inferences, by mimicking a healthy or an unhealthy body shape. In a series of studies, width-height ratio of drink yogurt packages was manipulated. Results indicated that a slim packaging increased healthiness inferences about the product, compared to a wide packaging. Furthermore, for slim packaging, product attitude and on-shelf brand recognition increased for participants who had a healthiness goal.

In this study, we aim to confirm the effect of packaging shape on healthiness perception by examining the effect of a slim versus wide packaging on healthiness perception. We predict that, in the absence of explicit product cues, slim packaging shape will increase product healthiness inferences. Furthermore, considering the negative relationship between product healthiness and tastiness (Raghunathan, Naylor, & Hoyer, 2006), we measure taste inferences for exploratory reasons.

H1: Packaging design cues affect product attribute perception accordingly, such that:

H1a: Packaging colour brightness acts as a cue for product quality perception

H1b: Packaging shape acts as a cue for product healthiness perception.

4.3.3 Combining design 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 attribute inferences. Therefore, the aim of this study is to investigate how consumers integrate design and explicit attributes 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.

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 attribute perception consists 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 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.

Miyazaki, et al. (2005) extended CCT by demonstrating for high-involvement products how incongruent cues for product quality (i.e., price and warranty) are processed. They predicted that perception of multiple quality cues could result either in an additive effect when cues are congruent (as CCT predicts), or can result in a negativity bias when cues are incongruent (i.e., diverging from Maheswaran and Chaiken, 1991). The authors investigated when the price-quality relationship holds in the presence of warranty cues (or vice versa), and found that the effect of either cue was stronger when paired with a congruent cue (i.e., high price paired with high warranty, or vice versa – an additive effect). When price and warranty were incongruent however, the more negative cue determined quality evaluation completely (increasing quality only in the high price / high quality condition). In this specific study however, both cues were considered as equally diagnostic, while in Maheswaran and Chaiken (1991) and Akdeniz et al. (2013), high versus low diagnosticity cues were used.

Similar as Maheswaran and Chaiken (1991), we predict 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 brightness will occur when the explicit cue also communicates high quality (i.e., high-end brand or high price). Similarly, an increase in healthiness perception as a result of slim packaging shape will occur when the explicit claim also communicates healthiness. 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-diagnosticity compared to design cues. Drawing from CCT, we predict that the effect of the packaging design cue will be discounted when it is incongruent with the explicit (more highly diagnostic) cue. Thus, we predict an interaction effect between explicit attribute cues and packaging design cues on product attribute perception, such that packaging

design cues will only affect product attribute inferences when they are congruent with explicit cues:

H2: There will be an interaction effect of the explicit cue and packaging design cue on attribute perception, such that:

H2a: When packaging colour is congruent with explicit quality cues, both cues will be used for quality inferences (additive effect). When packaging colour is incongruent with explicit quality cues, it will be discounted as an attribute cue (attenuation effect).

H2b: When packaging shape is congruent with explicit healthiness cues, both cues will be used for healthiness inferences (additive effect). When packaging shape is incongruent with explicit healthiness cues, it will be discounted as an attribute cue (attenuation effect).

In short, we examine 1) to what extent product design acts as an implicit cue for product attributes, and 2) to what extent congruence with other, explicit cues determines the efficacy of packaging design as an attribute cue. In doing so, we focus on two different design cues, colour and shape. In Study 1, we investigate how packaging colour brightness affects quality inferences, and how packaging shape affects healthiness inferences of food products. In Studies 2a and 2b, we examine how packaging colour brightness affects quality perception in the presence of congruent and incongruent explicit price and brand cues. In Study 3, we investigate how packaging shape affects healthiness perception in the presence of congruent and incongruent explicit product claims.

This is the first study that investigates the interaction between packaging design cues and explicit attribute cues on product attribute 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., 2015).

4.4 Study 1: Effects of packaging colour and shape

4.4.1 Method

Participants and design

Participants (N = 53, 66% Female, Mean Age = 48.62) were recruited via several associations and participated for a financial compensation. The single factor (design cue: low attribute cue, high attribute cue) between subjects experiment was completed individually and online. While the low attribute cue conditions represented 'low in quality' or 'low in healthiness', the high quality cue conditions represented 'high in quality' or 'high in healthiness'. Participants indicated their expectations regarding product attributes of three different products (crisps, coffee, and drink yogurt), each containing a different packaging cue. While the crisps and coffee packages were used to manipulate the quality cues, the drink yogurt packaging was used to manipulate the healthiness cue. The experimental between subjects condition (low versus high attribute cue) was randomly chosen for each packaging.

Furthermore, the order in which participants were presented with the packages was randomized between subjects.

Procedure

For each packaging design cue, participants were randomly assigned to either the low attribute cue or high attribute cue condition. In each condition, participants were presented with a comparative processing context. Specifically, participants saw four different products within the concerning product category, of which one was the product of interest (Figure 4.1). 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., 2015). All of the products were foreign and unfamiliar to the participants. Furthermore, the product of interest was depicted on the same position throughout conditions.

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

Packaging shape was manipulated using bottles of drink yogurt. In the wide shape (low healthiness cue) condition, the product of interest was a drink yogurt bottle of which the width-height ratio was altered to 0.4, while in the slim shape (high healthiness cue) condition; the width-height ratio was altered to 0.3. Apart from the shape of the bottle, the diameter of the bottleneck as well as the graphics on the front-of-packaging were kept constant.

Measures

In the colour conditions, quality perception was measured using the 7-pt Likert scale (*"The product appears to be of good quality"*; 1 = "totally disagree", 7 = "totally agree"). Furthermore, 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 7-pt scale. Participants also estimated the product price on a slider, ranging from 50 – 150 cents.

In the shape conditions, health perception was measured by caloric value inferences using a 2-item 7-pt. differential scale (i.e., "low in calories" – "high in calories"; "light" – "filling" (Cronbachs $\alpha = .82$)). Considering the positive relationship

between caloric value and expected tastiness (Raghunathan et al., 2006), flavour inferences were measured using a 2-item 7-pt. differential scale (7-pt) ("not tasty at all" – "very tasty"; "little flavour" – "much flavour" (Cronbachs $\alpha = .91$))

4.4.2 Results

Colour brightness of crisps packaging

The colour cue significantly affected quality perception, $F(1, 52) = 6.74, p = .012$, Partial $\eta^2 = .12$. Participants in the low brightness condition perceived the product as being of higher quality ($M = 4.82, SD = 1.00$) compared to participants in high brightness condition ($M = 3.92, SD = 1.45$). Furthermore, brand perception was marginally affected by the colour cue manipulation, $F(1,52) = 3.12, p = .08$, Partial $\eta^2 = .06$. The brand was associated with a high-end brand to a higher degree when colour brightness was low ($M = 4.25, SD = 1.61$), compared to when colour brightness was high ($M = 3.46, SD = 1.70$). Moreover, the colour cue affected price estimation, $F(1,52) = 7.00, p = .011$, Partial $\eta^2 = .12$. When colour brightness was low, participants expected the product to be more expensive ($M = \text{€}1,09, SD = .12$), compared to when brightness was high ($M = \text{€}0,97, SD = .18$).

Colour brightness of coffee packaging

For the second product category, the colour cue marginally affected quality perception, $F(1,52) = 3.66, p = .061$, Partial $\eta^2 = .07$. Participants perceived the product to be of higher quality when the packaging was black ($M = 5.47, SD = 1.41$), compared to when it was white ($M = 4.68, SD = 1.59$). Furthermore, brand perception was affected by the colour cue manipulation, $F(1,52) = 5.16, p = .027$, Partial $\eta^2 = .09$. The brand was associated with a high-end brand to a higher degree when the product packaging was dark ($M = 5.22, SD = 1.52$), compared to when the product packaging was bright ($M = 4.14, SD = 1.98$). Moreover, the colour cue affected price estimation, $F(1,52) = 7.57, p = .008$, Partial $\eta^2 = .13$. When the packaging was dark, participants expected the product to be more expensive ($M = \text{€}2,78, SD = .42$), compared to when the packaging was bright ($M = \text{€}2,44, SD = .48$).

Shape of drink yogurt packaging

Packaging shape significantly affected caloric value inferences, $F(1,53) = 5.10, p = .028$, Partial $\eta^2 = .09$. The product was expected to be of lower caloric value when its packaging was slim ($M = 3.13, SD = 1.24$), compared to wide ($M = 3.93, SD = 1.17$). Packaging design did not affect flavour inferences, $F(1, 53) = 1.79, p = .187$.

4.4.3 Conclusion

Results of this between subjects experiment indicated that subtle variations in packaging colour brightness affect consumers' judgments of quality- and healthiness related attributes. We found that lower colour brightness increases quality perceptions, brand perception and price expectations. Furthermore, we found that slimmer packaging shape decreases caloric value inferences. In the following studies, we investigate these effects in the presence of congruent and incongruent explicit quality and healthiness cues.

4.5 Study 2 - Packaging colour brightness and explicit quality cues

This study consists of two parts. In part A, the effect of packaging colour brightness on quality perception is investigated in the presence of product price as an explicit quality cue. In part B, the effect of packaging colour brightness on quality perception is investigated while now information about the market position of the brand is made available. Thus, we investigate the effect of packaging colour brightness in the presence of two different types of explicit quality cues: price and brand.

Identical packaging stimuli were used as in the pre-study. Each product packaging (crisps packaging or coffee packaging) was randomly allocated to either part A or part B of the experiment, such that each participant always completed part A and part B of the study with different products.

4.5.1 Part A: Packaging colour brightness and price

4.5.1.1 Method

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.

Design and procedure

A 2 (packaging colour: high brightness vs. low brightness) x 2 (price: low vs. high quality) between subjects design was used to test H2. Participants were randomly assigned to one of the colour cue (bright versus dark colour) between subject 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 products were being sold at a local foreign supermarket. This approach has the advantage that the brands were unknown to the participants, and participants did not have knowledge about objective quality, market position or price of the products. Furthermore, 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., 2015). Specifically, participants were presented with four different products within the concerning product category, of which one was the product of interest. Price was visible immediately below the product of interest (See Figure 4.1). 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.



Figure 4.1 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) are depicted. Stimuli from incongruent conditions are depicted. Left: low colour brightness x low price and low quality conditions. Right: high colour brightness x high price and high-end brand conditions. Note that both products were used in study 2A, as well as in study 2B.

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” (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, the skepticism towards advertising scale (Obermiller & Spangenberg, 1998) was slightly adjusted and measured for exploratory reasons.

4.5.1.2 Results

Preparatory analyses

As age was negatively correlated with quality perception (Pearson $r = -.16$, $p = .01$), 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 ($M = 4.37$, $SD = 1.13$), $F(1, 237) = 76.88$, $p < .001$, Partial $\eta^2 = .25$. These effects did not differ between product types, $p = .20$. Furthermore, Scepticism towards advertising did not affect any of the dependent variables, and is therefore not reported further on.

Quality perception

Package colour brightness significantly affected quality perception, $F(1, 237) = 12.52$, $p < .001$, Partial $\eta^2 = .05$. A product packaging design with a darker colour was associated with a higher quality ($M = 5.04$, $SD = 1.21$) compared to a design with a brighter colour ($M = 4.51$, $SD = 1.21$). Price however, did not affect quality perception, $F(1, 239) = .17$, $p = .68$, neither was there an interaction effect between packaging colour brightness and price, $F(1, 239) = .014$, $p = .91$.

Perceived market position

Packaging colour brightness also affected whether the brand was perceived as high-end (vs. low-end), $F(1, 237) = 16.19$, $p < .001$, Partial $\eta^2 = .06$. The brand was associated more with high-end when packaging colour was darker ($M = 4.40$, $SD = 1.74$) compared to brighter ($M = 3.56$, $SD = 1.90$). Moreover, price did not affect perceived market position, $F(1, 237) = 1.00$, $p = .32$, neither was there an interaction effect between packaging colour brightness and price, $F(1, 239) = .12$, $p = .73$.

Product Attitude

Packaging colour brightness affected product attitude as well, $F(1, 237) = 15.16$, $p < .001$, Partial $\eta^2 = .06$. Attitude towards the product was more positive when the packaging colour was darker ($M = 3.91$, $SD = 1.34$), compared to brighter ($M = 4.50$, $SD = 1.32$). Price did not affect product attitude, $F(1, 237) = .09$, $p = .76$. Again, there was no interaction effect between colour brightness and price, $F(1, 237) = .60$, $p = .44$.

4.5.1.3 Conclusion and discussion

We found that in the presence of price as an explicit quality cue, product packaging brightness positively increases product quality perception, brand associations and product attitude. However, our expectations that packaging brightness would only affect consumer evaluations when price was congruent (e.g., a high price in combination with a low colour brightness) was not confirmed. Instead, we found that packaging colour brightness 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 inference by consumers (e.g., Rao, 2005). Some characteristics that are specific for this study may explain these results. Possibly, the effect of product packaging colour brightness 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). 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 colour brightness would exert the same effects when paired with a stronger explicit quality cue: brand information.

4.5.2 Part B: Packaging colour brightness and market position of the brand

We investigate whether product packaging colour 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. When participants had received brand X in part A, they always received brand Y in Part B and vice versa.

4.5.2.1 Method

A 2 (packaging colour: high brightness vs. low brightness) x 2 (brand position: low-end vs. high-end) between subjects design was used to test H2. The procedure 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, Howlett, & Burton, 2015). Under the product packaging the brand name and brand information was visible (i.e. "(low-end brand)" vs. "(high-end brand)", see appendix B.

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 "De product price is high (1 = totally disagree, 7 = totally agree). Subsequently, product attitude was measured using three semantic differential scales (Chang & Thorston, 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.

4.5.2.2 Results

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 de high-end condition ($M = 4.39$,

$SD = .16$), compared to the low-end condition ($M = 3.44$, $SD = .17$), $F(1,237) = 16.43$, $p < .001$, Partial $\eta^2 = .07$. These effects did not differ between product types, $p = .80$.

Quality perception

When information about the market position of the brand was made available, package colour brightness significantly affected quality perception, $F(1, 237) = 11.99$, $p < .001$, Partial $\eta^2 = .05$. A product packaging design with a darker colour was associated with a higher quality ($M = 4.85$, $SD = 1.28$) compared to a design with a brighter colour ($M = 4.26$, $SD = 1.43$). Furthermore, market position of the brand affected quality perception, $F(1, 237) = 20.90$, $p < .001$, Partial $\eta^2 = .08$. 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 brightness and brand, $F(1, 237) = 1.59$, $p = .21$.

Price inferences

Packaging colour brightness also affected price inferences that participants made about the product, $F(1, 237) = 27.71$, $p < .001$, Partial $\eta^2 = .11$. The product was expected to be more expensive on a 7-pt scale when packaging colour was darker ($M = 4.34$, $SD = 1.42$) compared to brighter ($M = 3.40$, $SD = 1.58$). Moreover, market position of the brand affected price inferences, $F(1, 237) = 58.53$, $p < .001$, Partial $\eta^2 = .20$. Price perception was 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 colour brightness and brand, $F(1, 237) = 3.99$, $p = .047$, Partial $\eta^2 = .02$. The effect of packaging colour brightness on price inferences was slightly stronger when the brand was presented as low-end ($B = 1.27$), compared to high-end ($B = .56$).

Product attitude

Packaging colour brightness affected product attitude as well, $F(1, 237) = 19.83$, $p < .001$, Partial $\eta^2 = .08$. Attitude towards the product was more positive when the packaging colour was darker ($M = 3.67$, $SD = .95$), compared to brighter ($M = 3.11$, $SD = .99$). Furthermore, brand affected product attitude, $F(1, 237) = 6.91$, $p = .009$. Product Attitude was higher when the brand was high-end ($M = 3.56$, $SD = 1.02$) compared to low-end ($M = .3.23$, $SD = .97$). There was no interaction effect between colour brightness and brand, $F(1, 237) = .86$, $p = .35$.

4.5.2.3 Conclusion and discussion

We found that independently from brand as an explicit quality cue, a lower product packaging brightness positively increases product quality perception, price inferences and product attitude. Again, our expectation that a lower packaging brightness would only affect consumer evaluations when brand was congruent (e.g., a high-end brand in combination with a darker colour) was not confirmed. Instead, we found that packaging colour brightness 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 was slightly stronger for low-end brands compared to high-end brands. Thus, also in the presence of a stronger

quality cue than price, packaging design may exert a strong effect on consumer evaluations. These findings are in line with former studies (Brucks et al, 2000; Rao & Monroe, 1989), which indicate that brand is a stronger cue for quality compared to price. Results indicate that colour brightness is an example of a cue that affects product attribute perception and consumer evaluations. Contrary to our expectations (H2a), colour brightness affected product attribute perception regardless of congruent explicit quality cues. So far however, we have only investigated the effect of implicit cues in the domain of product quality perception. To demonstrate whether packaging design exerts the same independent influence in other domains than quality, we conducted a second study in which we investigate the effect of packaging shape on healthiness perception in combination with healthiness-related claims. As claims are more direct attribute cues compared to price or brand information (i.e., they communicate the attribute directly), we expect the effect of claims on attribute perception to be stronger, and perhaps to overrule the effect of packaging design.

4.6 Study 3 - Effects of packaging shape

4.6.1 Method

Participants and design

Participants (N = 283, 77% female, Mean age = 21.86) were invited via the University's participant pool, and received course credits or a financial compensation for their participation. Participants were randomly allocated to one of the conditions in the 2 (shape: wide, slim) x 2 (claim: tasty, healthy) between subjects design. Stimuli were similar as in the pre-test. In the wide shape condition, participants were presented with the drink yogurt bottle with the wide shape, while participants in the slim shape condition received the same product in the slim shaped bottle. Furthermore, in the tasty claim condition, the phrase "Rich & creamy" was visible on the packaging, while in the healthy claim condition, "Light & fit" was visible (See Figure 4.2). These claims were chosen as they both communicate (low vs. high) healthiness of the product, while both are positively valenced.

Procedure

Similar as in Studies 2a and 2b, participants were told that the products were being sold at a local foreign supermarket. This approach has the advantage that the brands were unknown to the participants, and participants did not have knowledge about product healthiness or flavour of the products. In each condition participants were presented with a comparative processing context that was adopted from the pre-study. Specifically, participants saw four different drink yogurt products, of which one was the product of interest (See Figure 4.2). Depending on the experimental condition, participants were presented with a bottle that varied in shape and claim version.

Energetic value inferences were measured using a 2-item 7-pt. differential scale (i.e., "low in calories" – "high in calories"; "light" – "filling" (Cronbach's $\alpha = .58$)). As Cronbach's α was poor, these items were analysed as separate measurements

for energetic value. Furthermore, flavour inferences were measured using a 2-item 7-pt. differential scale (7-pt) (“not tasty at all” – “very tasty”; “little flavour” – “much flavour” (Cronbach’s $\alpha = .77$)).



Figure 4.2 Part of the stimulus material from Study 3. Stimuli from incongruent conditions are depicted. Left: slim packaging shape x unhealthy claim condition. Right: wide packaging shape x healthy claim condition.

As another study suggested a possible relationship between packaging shape and volume perception (Folkes & Matta, 2004), we measured perceived product packaging volume to control for any confounding effects on energetic value inferences (“How many Milliliter product do you expect this packaging to contain?” 1 = a lower amount than the other products, 2 = a similar amount as the other products, 3 = a higher amount than the other products). Furthermore, we measured whether participants were aware of any influences of packaging design on their responses using a 7-pt scale (i.e., “To what extent did you let packaging design affect your responses regarding the products?”).

4.6.2 Results

Preparatory analyses

Gender affected energetic value inferences, such that females made slightly higher caloric inferences ($M = 4.06$, $SD = .91$) than males ($M = 3.84$, $SD = .88$), $F(2, 277) = 4.31$, $p = .014$, Partial $\eta^2 = .03$. As gender did not interact with any independent variable on our dependent measures and did not change significance of the results, it is not reported in the analyses. Furthermore, estimations of packaging volume affected inferences regarding energetic value of the product, $F(2, 277) = 5.52$, $p = .004$, Partial $\eta^2 = .04$. Since estimations of packaging volume did not change significance of the results, analyses without this variable are reported.

Perceived energetic value

As Cronbach's α was low (.58), we conducted a MANOVA with the two scale items separately (this rendered the same results as when the mean of these items was treated as a single dependent variable). Packaging shape did not affect caloric inferences, $F(2, 277) = .67, p = .52$. However, the claim influenced caloric inferences, $F(2, 277) = 45.40$, Partial $\eta^2 = .25$. The product was expected to be of lower caloric value ($M = 3.56; SD = 1.55$) and less filling ($M = 3.96, SD = 1.38$) when the healthy claim was visible, compared to when the tasty claim was visible (resp. $M = 5.19, SD = 1.56; M = 4.78, SD = 1.57$). There was no interaction between shape and claim, $F(2, 277) = .17, p = .85$. Packaging design did not affect flavour inferences, $F(1, 53) = 1.79, p = .187$.

Tastiness

Packaging shape affected tastiness inferences, $F(1, 278) = 4.92, p = .027$, Partial $\eta^2 = .02$. The product was expected to be tastier when its packaging shape was wide ($M = 4.14, SD = 1.68$) as opposed to slim ($M = 3.75, SD = 1.77$). Claim did not affect tastiness inferences, $F(1, 278) = .44, p = .51$. There was no interaction effect between shape and claim, $F(1, 278) = .22, p = .64$.

4.6.3 Conclusion

Results indicated that packaging shape significantly affects healthiness inferences. However, when claims about the products' healthiness and flavour were visible on the packaging, the effect of packaging design on healthiness inferences disappeared. In this case, explicit information had a strong effect on healthiness inferences. Results indicated that in the presence of claims, packaging shape affected flavour inferences, regardless of the type of claim. In this case, a wide packaging shape induced more positive tastiness inferences (i.e., tastier, more flavour) compared to a slim packaging shape. We will discuss the possibility that packaging shape may exert an indirect effect on tastiness inferences via implicit healthiness associations.

4.7 General discussion

Four studies demonstrated that for two different design cues, and two different product attributes, packaging design of CPGs significantly influences product attribute perception. Furthermore, we found that in general, packaging design affects product attribute perception independently from explicit attribute information (i.e., price, brand, or claims) 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 attribute perception independently from explicit attribute 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. Possibly, the effect of low-diagnostics 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). Therefore, future studies should examine the interaction between packaging design and explicit cues for higher-involvement goods.

Specifically, we demonstrated that decreased packaging colour brightness affects product quality perception 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, packaging colour brightness 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 independently from the effect of brand position.

To assess whether packaging design would exert similar effects for other types of cues and product attributes, we demonstrated how packaging shape affects healthiness and tastiness inferences. Building on existing work that demonstrates the positive effect of slim packaging shape on healthiness inferences (Van Ooijen et al., 2016), we investigated whether this effect would hold when explicit tastiness and healthiness claims were visible on the product packaging. We demonstrated that a slim packaging shape affected healthiness inferences when no explicit healthiness or tastiness related information was presented. However, when those claims were visible on the product packaging, the effect of packaging shape disappeared. In this case, shape affected tastiness inferences of the product. In view of other research that indicates a relationship between healthiness and tastiness perception (Liem et al., 2012, Raghunathan et al., 2006), it is probable that packaging shape may indirectly affect tastiness inferences via implicit healthiness associations. In the context of this study, packaging induced healthiness inferences may be overruled by the explicit healthiness related claims on the packaging, although consumers may not use these explicit claims to infer tastiness related attributes. Thus, in the context of shape as packaging cue for healthiness, the effect of explicit claims may be too strong for packaging design to affect product attribute perception. Additional research is necessary to investigate how healthiness claims and packaging design interact in the establishment of tastiness inferences, and whether the effect of packaging shape is as strong as effects of packaging colour on product attribute perception (see also Hine, 1995).

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 products 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.

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 attribute perception in the presence of explicit attribute information. Since our results indicate that overall, packaging design affects product attribute 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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5

Conclusion, discussion and implications

5.1 Conclusion

In this dissertation, the effect of packaging design cues on attribute inferences of food products was examined. In the first empirical chapter, we demonstrated how atypical product design affects the persuasive impact of product claims. It was found that atypical product design affects attribute perception indirectly, by increasing the positive effect of strong claims on quality perception and the negative effect of weak claims on willingness to pay through enhanced processing of those claims. In the second empirical chapter, we showed that packaging shape that simulates either slim or wide body shapes increases healthiness inferences for food products. Furthermore, under congruent consumer goals, product recognition and product evaluation increased when packaging shape was slim. In the third empirical chapter, it was found that overall, packaging design cues still affect product attribute perception when (congruent or incongruent) explicit attribute information is available. This was especially the case when explicit cues were less diagnostic (i.e., price or market position of the brand). When we examined the effect of packaging design cues in the presence of a highly diagnostic explicit cue (i.e., a product claim), the explicit cue overruled the effect of the packaging design cue. In general, we demonstrated that subtle packaging design cues are effective in influencing consumers' product attribute inferences.

5.2 Discussion

Despite its importance, packaging design is understudied in the consumer behavior literature. Until recently, scholars have merely focused on packaging as a communication vehicle that 'carries' explicit persuasive information, such as claims or labels. Based on information processing theories, this dissertation emphasizes the subtle, symbolic and metaphoric effects of packaging design on product attribute inferences. Hence, this dissertation provides a valuable source of information on how information processing theories, such as the Elaboration Likelihood Model (Petty & Cacioppo, 1986), embodiment accounts (Barsalou, 2008; Lakoff & Johnson, 1999), and Cue Consistency Theory (Maheswaren & Chaiken, 1991) apply to consumers' processing of product packaging design. Knowledge on the application of these theories is important, as these theories help to explain and predict when and how consumers are affected by packaging design cues.

The attention-grabbing properties of packaging typicality, as well as its aesthetical function, have been examined thoroughly in the literature (Bloch, 1995; Veryzer

& Hutchinson, 1998). In Chapter 2, we contribute to existing literature by demonstrating that atypical packaging design also affects product attribute perception in an indirect way, that is, by increasing processing of explicit product information. These results are in line with theories on heuristic-systematic processing of information (Petty & Cacioppo, 1986) and fluency effects on information processing (Oppenheimer, 2008). By examining the application of these mechanisms on consumers' processing of packaging design, we have demonstrated the interactive effect of packaging design and explicit product information on product attribute perception.

Moreover, in Chapters 3 and 4 it is demonstrated that packaging design communicates product attributes subtly via symbolism and metaphors. In doing so, we answer to a recent interest in packaging design as a symbolic communicator of product attributes such as strength of taste, bitterness or lightness (Becker, van Rompay, Schifferstein, & Galetzka, 2011; Spence, 2012; van Rompay, Franssen, & Borgelink, 2014). This dissertation contributes to this line of research by examining how packaging design cues affect inferences on product attributes that have been studied predominantly as consequences of explicit attribute cues: healthiness and quality.

In Chapter 3, we show that packaging shape affects healthiness perception by simulating a slim versus wide body shape. Inspired by embodiment accounts (Barsalou, 1999; Carlston, 1994; Lakoff & Johnson, 1999), we find that slim packaging is associated with increased product healthiness, and increases product evaluation and product recognition when consumers have a healthiness goal. Furthermore, we demonstrate the occurrence of automatic associations between shape and healthiness. We do not, however, demonstrate that the effect of packaging shape on product-related responses is mediated by embodied associations between shape and healthiness perception. Future research should therefore examine the underlying process by which the effect of packaging shape on consumers' healthiness-related evaluations. In contrast to more traditional social cognition research (which is based on the idea that perceptual information is encoded into semantic concepts or a 'mental dictionary'), embodiment accounts argue that sensory information is activated during cognitive processes, and unconsciously contributes to the understanding of concepts (Lakens, 2014). This mechanism is assumed to take place as a result of experiential co-occurrence between sensory information and conceptual information (Lakoff & Johnson, 1999). However, there are no clear models that describe the underlying process of this mechanism, which makes it difficult to define when metaphors are used, and exactly how they affect conceptual inferences. As a result, there is an on-going debate about the question whether activation of sensory(motor) information is a crucial part of thought, or whether it simply enriches conceptual thought (Lakens (2014). As embodiment is an automatic and unconscious process, measurement of underlying processes may be problematic. Therefore, neuro-scientific research may provide an important input to examine these processes, for instance by comparing the brain areas that become activated when consumers think about concepts such as healthiness and when they are presented with certain shapes (cf. Decety & Grèzes, 2006).

Chapter 4 demonstrates that colour brightness affects product quality inferences. Although the effect of colour in marketing has been studied before (See Singh, 2006, for an overview), this is the first study that systematically examines how colour of packaging affects quality perception within a range of product types. With regard to the concept quality, this dissertation regards quality as a comparative, evaluative and abstract attribute. That is, quality is regarded and measured as an overall evaluative judgment, rather than a concrete quality conceptualisation, such as ease of use (Steenkamp, 1990). Inferences on an abstract conceptualization of quality (rather than a concrete one) may be particularly associated with cues that communicate quality in a symbolic way (i.e., colour), since abstract cues are more likely to affect abstract inferences (Tversky, 2011). Nonetheless, it would be fruitful to investigate whether colour brightness affects inferences on more concrete components of quality, such as ease of use or performance (Brucks, Zeithaml, & Naylor, 2000). Similarly, in Chapter 3 we find stronger effects of packaging shape on general healthiness inferences compared to concrete healthiness inferences (i.e., estimation of the number of calories that a product contains). Again, these results indicate that metaphoric and symbolic cues may have stronger effects on abstract inferences than on concrete inferences. This idea needs further examination before it can be established.

In Chapter 4, we replicate and extend earlier work by demonstrating that packaging colour brightness and packaging shape affect quality and healthiness inferences. Importantly, we show that in general, packaging design still affects attribute inferences when explicit attribute cues are available. Thus, packaging cues may affect attribute inferences independently, and may be used to strengthen the effect of explicit packaging claims (or vice versa). Furthermore, our results indicate that the relative effect of packaging design decreases as explicit cues become higher in diagnosticity (See also Akdeniz, Calantone, & Voorhees, 2013). That is, in Study 2a we find that price does not affect quality inferences, while a lower packaging colour brightness increases quality inferences. In Study 2b, results indicate that market position of the brand and packaging design independently affect quality perception. In Study 3, we use explicit packaging claims that communicate low or high healthiness, and find that these explicit claims overrule the effect of packaging shape on healthiness inferences. Thus, it seems that the effect of packaging design might decrease when explicit cue diagnosticity increases – in this case, the high diagnosticity of explicit cues might overrule the effect of packaging design. Interestingly, this decreasing effect of packaging design might disappear under conditions of extreme cognitive load, where consumers are unable to systematically process highly diagnostic packaging cues, such as product claims, and would be more susceptible to design cues. In this dissertation, we examined consumers' responses to food products, a product category that is typically low-involvement. We assume that consumers process packaging design in a heuristic processing mode, rather than systematically. Future research should examine whether effects of packaging design, as opposed to explicit attribute cues, could be enhanced further under conditions of extreme cognitive load (versus low cognitive load). Possibly, the effect of packaging design would be enhanced under high cognitive load when explicit (high diagnosticity) cues are available (c.f. Mitra, 1995).

In many cases, consumer behaviour is the result of implicit or unconscious processes (Chartrand & Fitzsimons, 2011). Although we have measured product attribute perception (predominantly) using explicit measures, it is assumed that packaging design exerts implicit (i.e., subconscious) effect on product attribute perception. This does not mean that it is assumed that packaging design cues are perceived without awareness (i.e. subliminally), or that consumers do not perceive packaging cues consciously. Rather, we argue that consumers are not aware of the persuasive effect of packaging design on product related attributes. That is, consumers may be aware of the cue itself, but are not aware of the persuasive effect it evokes (Chartrand, 2005). As also argued by Vandenberg and Veltkamp (2016) explicit measurements are suitable to measure the effects of implicit processes on consumer behaviour, but are unsuitable to measure the evoked implicit process itself. Hence, future research on packaging design should examine to what extent these processes are subconscious using implicit measurements.

To increase external validity of our results, we used existing product packaging (elements) as stimuli in most parts of our chapters. Brands and packaging selected as stimuli were always unfamiliar to participants to avoid confounds with brand familiarity (Orth & Malkewitz, 2008). At the same time, this raises the question how packaging design affects consumers' product evaluations when consumers are familiar with brands, and have perhaps developed brand associations and attitudes towards the brand. Possibly, packaging design elements exert a less strong effect of product attribute inferences for high-equity brands, which may be strongly associated with specific product attributes already (Keller, 1993).

Furthermore, to examine effects of packaging design elements on consumers' attribute inferences, we conducted online and lab experiments. This method provides a possibility to manipulate subtle and isolated elements of packaging design, in a relatively controlled environment. This increases internal validity of our results, though these methods do not profit from the advantages regarding external validity of field-experiments in stores. That is, field experiments would provide a more realistic shopping context in which the consumer is highly distracted by, for instance, advertising and a large range of offered products (i.e., a comparative context). Therefore, it is likely that consumers are even more affected by (heuristic) packaging cues when those are examined in field-experiments. Although manipulating and measuring consumer responses to packaging design elements on the shelves may be problematic, future research on consumers' responses to packaging design elements should aim to investigate these effects in contexts that more closely represent retail situations, such as comparative processing contexts. Because comparative processing is more cognitively challenging than processing (evaluating) a single product, (Newman, Howlett, & Burton, 2015) packaging design cues should be studied in such a comparative context. In Chapters 3 and 4, we have already adopted comparative contexts, such as realistic product shelves that contain dozens of products (Chapter 3, Study 3).

5.3 Is the use of packaging design as persuasive cue ethical?

Like other forms of advertising, 'packvertising' intends to influence the way consumers think and feel about a product or brand. Besides the obvious advantages of packaging-based advertising for companies or brands, the communicative value of packaging design also has advantages for consumers. Specifically, packaging design may facilitate product categorization and recognition (as demonstrated in Chapter 3) and may even enhance product experience by improving the perceived quality and effectiveness of products during actual consumption (cf., Shiv, Carmon, & Ariely, 2005). The implicit character of packaging design as a persuasive cue, however, raises some ethical concerns.

The first concern reflects a deontological approach to business ethics, which does not question the ethical character of implicit persuasive cues in light of its consequences, but rather applies to the way that implicit persuasive cues operate (Nantel & Weeks, 1996). Different than in regular ('explicit') forms of advertising, in the case of packaging design cues consumers may lack awareness of the fact that they are (attempted to) being influenced. Hence, packaging design cues share characteristics with 'subliminal' advertising, which is a form of advertising that is used with the intention to be perceived unconsciously. In the case of subliminal advertising, consumers are not aware of the implicit cue itself, neither of the automatic process it evokes (cf. Chartrand, 2005). While consumers may be aware of the implicit cue in the case of packaging design, it is likely that in most cases, consumers lack awareness of the automatic process that packaging design evokes (e.g., the effect of packaging shape on healthiness perception). Therefore, like subliminal advertising, the use of packaging design as a persuasive cue may harm the autonomy of consumers, and prevent consumers from making informed decisions about their (purchase) behaviour. Also, people in general indicate to feel uncomfortable with the idea that their behaviour occurs automatically and unconsciously (Bargh & Chartrand, 1999), particularly when related to advertising (Nebenzahl & Jaffe, 1998).

However, implicit cues may not be the only form of advertising that might harm the autonomy of consumers. Considering consumers' limited availability of cognitive resources, regular (explicit) forms of advertising may not always be consciously processed either. For instance, when consumers lack cognitive resources due to cognitive load, they may unconsciously use price or weak claims as fast-and-frugal cue for quality, while more reliable sources of quality-related information are used in a situation where cognitive resources are abundant. Thus, whether an advertising cue is implicit in a given situation does not only depend on the extent to which it is subtly embedded in an advertisement or packaging, but also relies on the amount of cognitive resources that a consumer uses to process the object. That is, when an explicit cue is processed heuristically, the cue may also exert an implicit, unconscious effect on consumers' attitudes and behaviour. When approached from this angle, regular forms of advertising may be just as harmful for consumer autonomy as packaging design cues.

According to the utilitarian approach of (business) ethics, whether advertising is ethical or not depends on its consequences, rather than on the way in which persuasive cues operate. From this perspective, the degree to which advertising is ethical would reflect the degree to which the end justifies the means (Nantel & Weeks, 1996). This end should be to satisfy consumers' needs, which could be short-term oriented (e.g., hedonic) or long-term oriented (e.g., healthiness). In the case of subtle packaging cues that communicate product healthiness, the use of packaging design as persuasive cue obviously serves the goal to increase choice of healthier food products. Thus, from a utilitarian perspective, the use of packaging design as an implicit persuasive cue would be permissible, since it contributes to the well-being of the consumer (i.e., a consumer need). Obviously, this argument applies only when the symbolic meaning of a design cue reflects the actual content of the product.

5.4 Practical implications

Research about the effects of packaging design cues on consumers' attribute inferences is still in its infancy, and this dissertation provides an important contribution in establishing such effects. Our findings stress the importance of packaging design cues as contributors of product and brand impressions, and hence provide valuable input for both scholars and brand managers.

To date, research on the role of packaging design cues in consumers' attribute inferences has been based mostly on anecdotal or explorative evidence (Orth & Malkewitz, 2008; Underwood, 2003; cf. Ampuero & Vila, 2006). Furthermore, in the packaging design process, designers often indicate to rely more on their 'gut feeling', rather than on systematic evidence that indicates a design's effectiveness (Hine, 1995). In practice, examining the effectiveness of a company's packaging design often entails testing a number of different designs that vary on more than one cue (e.g., Vandenberg & Veltkamp, 2016). This dissertation examines how systematic manipulation of cues affects product attribute perception, and how they interact with other (packaging) information and consumer goals. Furthermore, we examine this throughout several product categories. Hence, this research increases our ability to understand how single packaging elements affect product attribute perception, and gives us the opportunity to draw conclusions about design effects that are more broadly applicable. As a result, these findings provide a handle or starting for packaging designers and brand managers who aim to communicate specific product attributes, such as quality or healthiness (or aim to *not* communicate these attributes).

We have demonstrated that packaging design is not merely a 'vehicle' for explicit cues such as claims and logos, but also has communicative value in itself. First, brand managers should be aware of the implicit, symbolic effects of packaging design on consumers' attribute (i.e., healthiness- or quality-) inferences. Second, we demonstrated that brand managers should note that packaging design might in some cases interact with explicit information on packaging. Specifically, we have

shown that packaging design may increase or decrease the effectiveness of product claims by grabbing attention (Chapter 2) and that its effectiveness may also be dependent on whether explicit packaging claims are congruent with design cues or not (Chapter 3). Therefore, brand managers should not only mind the direct effects of subtle design cues on product attribute inferences, but also note that packaging design cues do not act independently in all cases. However, with regard to product quality inferences, we found that packaging colour acted independently from explicit information such as brand and price (Chapter 4), and even overruled the effect of price on quality perception (Study 2). This emphasizes the powerful role of packaging design in the formation of brand associations.

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Chapter 2 – Atypicality as indirect cue

Author IvO had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: IvO, PV, MF, and ES. Data acquisition and analysis: IvO. Data interpretation: IvO, PV, MF, ES. Drafting of the manuscript: IvO. Critical review of the manuscript: PV, MF, ES.

Chapter 2 – Shape as healthiness cue

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Chapter 3 – Overruled by explicit cues?

Author IvO had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: IvO, MF, PV, ES. Data acquisition and analysis: IvO. Data interpretation: IvO, MF, PV, ES. Drafting of the manuscript: IvO. Critical review of the manuscript: MF, PV, ES.

Nederlandse samenvatting

Introductie

De voedingsindustrie heeft te maken met almaar toenemende concurrentie. Het succes van een merk is daarmee sterk afhankelijk geworden van branding. Verpakkingen hebben hierbij een steeds belangrijkere rol ingenomen, ze fungeren immers als laatste contactmoment tussen merk en consument voordat een aankoop wordt gedaan. Zij spreken tot de consument in drukke en overvolle winkelomgevingen waar aankoopbeslissingen worden genomen.

Drukke winkelomgevingen en een lage betrokkenheid bij productaankopen zorgen ervoor dat consumenten productinformatie vaak slechts oppervlakkig verwerken, in plaats van systematisch. Het is vastgesteld dat heuristische informatie, zoals logo's, prijzen en keurmerken de perceptie van producteigenschappen zoals kwaliteit en gezondheid beïnvloeden. Deze dissertatie richt zich niet op dit soort expliciete uitingen, maar onderzoekt het effect van (het meer impliciete signaal) verpakkingsdesign op de perceptie van producteigenschappen. In het bijzonder wordt onderzocht in hoeverre variaties in elementen van verpakkingsdesign, zoals vorm en kleur, perceptie van producteigenschappen beïnvloeden. In tegenstelling tot het expliciet communiceren van informatie, brengt verpakkingsdesign automatische associaties teweeg die (kunnen) bijdragen aan de identiteit van een product. Verpakkingsdesign houdt verband met een meer onbewuste kant van het beslissingsproces, omdat consumenten zich – anders dan bij expliciete informatie – vaak niet bewust zijn van het persuasieve karakter van verpakkingsdesign.

Veel recent onderzoek naar het effect van verpakkingsdesign op perceptie van producteigenschappen is gebaseerd op het concept dat consumenten inferenties over (abstracte) producteigenschappen baseren op concrete zintuigelijke informatie, zoals beweging, vorm of kleur. Deze zintuigelijke informatie kan dienen als symbool of metafoor voor producteigenschappen. Een voorbeeld is de hoekigheid van verpakkingen – hoe hoekiger een verpakking, hoe intenser de smaak van een product wordt ervaren door participanten die gevoelig zijn voor design. Ook wordt een hoekige verpakking geassocieerd met kracht, waardoor consumenten een hogere productprijs verwachten. Exploratief onderzoek toont aan dat ook kleur dit soort associaties teweeg kan brengen – zo worden donkere kleuren geassocieerd met kwaliteitsproducten, terwijl lichtere kleuren met een lagere kwaliteit worden geassocieerd.

Deze dissertatie richt zich op twee typen inferenties die consumenten maken op basis van verpakkingsdesign – kwaliteitsinferenties en gezondheidsinferenties. Ten eerste worden effecten van verpakkingsdesign op kwaliteitsperceptie onderzocht. Hoewel er veel onderzoek is gedaan naar effecten van expliciete informatie (zoals prijs of claims) op kwaliteitsperceptie, is er weinig onderzoek dat zich richt op de effecten van verpakkingsdesign op kwaliteitsperceptie. Mogelijk heeft verpakkingsdesign effect op perceptie van kwaliteit gerelateerde concepten, zoals verwachtingen

met betrekking tot de productprijs of de bereidheid tot betalen. Effecten van verpakkingsdesign op kwaliteit gerelateerde perceptie worden onderzocht in hoofdstuk 2 en 4. Ten tweede worden in dit proefschrift effecten van verpakkingsdesign op gezondheidsperceptie onderzocht. Overgewicht wordt in Westerse geïndustrialiseerde landen een steeds groter probleem, waardoor de vraag naar gezonder voedsel groter wordt. Hoewel veel onderzoek zich heeft gericht op effecten van logo's en claims op gezondheidsperceptie van producten, is er weinig onderzoek gedaan naar de rol van verpakkingsdesign bij de gezondheidsperceptie van producten. Verpakkingsdesign kan een nuttige tool zijn om gezondheid te communiceren en zo gezondere consumptie te faciliteren. Deze effecten worden onderzocht in hoofdstuk 3 en 4.

Hoofdstuk 2 - Niet-typerende verpakkingen en verwerking van kwaliteitsclaims

In hoofdstuk 2 wordt gedemonstreerd hoe verpakkingsdesign kwaliteitsperceptie indirect beïnvloedt. Er wordt voorspeld en bewezen dat atypische verpakkingen een negatief effect hebben op productevaluatie wanneer deze gepresenteerd worden met zwakke productclaims. Atypische verpakkingen voorkomen snelle en automatische productcategorisatie en faciliteren systematische verwerking van expliciete informatie die tegelijkertijd wordt aangeboden. Aan participanten werd een online winkelomgeving gepresenteerd waarin een product met ofwel een typische, ofwel een atypische verpakking werd getoond. Ook werden ofwel zwakke, ofwel sterke kwaliteitsclaims bij het product getoond. De resultaten lieten zien dat verpakkingen met een atypische vorm cognitieve verwerking van informatie deed toenemen. Hierdoor werden zowel zwakke als sterke claims beter verwerkt. Als gevolg hiervan hadden zwakke claims een negatiever effect op bereidheid tot betalen als atypische verpakkingen werden gebruikt, en hadden sterke claims een positiever effect op kwaliteitsperceptie als atypische verpakkingen werden gebruikt. Atypische verpakkingen hebben de eigenschappen om verwerking van expliciete productinformatie te beïnvloeden en hebben indirect een effect op kwaliteitsperceptie. De keuze om atypische verpakkingen te gebruiken zou dus afhankelijk moeten zijn van de mate waarin overtuigende productclaims worden gebruikt.

Hoofdstuk 3 – Verpakkingsvorm en gezondheidsperceptie

Waar hoofdstuk 2 laat zien hoe expliciete claims productevaluatie beïnvloeden door verpakkingsdesign, richt hoofdstuk 3 zich op directe invloeden van verpakkingsdesign op perceptie van producteigenschappen. Er wordt gedemonstreerd dat verpakkingen met een slanke vorm (dat wil zeggen: relatief hoger en minder breed) associaties met gezondheid teweegbrengen. Door middel van verschillende experimenten wordt aangetoond dat een slanke verpakkingsvorm op een symbolische manier gezondheid communiceert. Wanneer participanten een gezondheidsdoel hadden,

evalueerden zij een product als positiever wanneer de verpakking een slankere (ten opzichte van bredere) vorm had. Ook evalueerden participanten gezonde producten als positiever, en vonden zij gezonde producten sneller in het schap wanneer de verpakking slanker was. Deze resultaten tonen aan dat verpakkingsdesign op intuïtieve wijze gezondheid communiceert, ook zonder het gebruik van expliciete gezondheidsclaims. Verpakkingsdesign fungeert dus als tool om de gezondheidseigenschappen van producten te communiceren en het categoriseren van (gezonde) producten te faciliteren. Ook wordt aangetoond dat specifieke designelementen productevaluatie in het bijzonder beïnvloeden wanneer deze overeenkomen met actieve (gezondheids)doelen.

Hoofdstuk 4 – Verpakkingsdesign en expliciete productinformatie

In winkels komen consumenten tegelijkertijd in aanraking met verpakkingsdesign en expliciete productinformatie. Hoofdstuk 4 richt zich daarom op effecten van verpakkingsdesign op perceptie van producteigenschappen wanneer congruente of incongruente expliciete productinformatie (zoals prijs, merk en claims) beschikbaar is. Omdat prijs, merk en claims vaak gebruikt worden als heuristieken om producteigenschappen te beoordelen, bestaat de mogelijkheid dat deze expliciete signalen het effect van design op perceptie van producteigenschappen overschaduwden of verminderden. Om dit te onderzoeken, kregen participanten productverpakkingen te zien die designelementen bevatten die ofwel een lage kwaliteit (felle kleur) of hoge kwaliteit (minder felle kleur) communiceerden. Ook kregen participanten een verpakkingsdesign te zien dat ofwel een hogere gezondheid (hoge, slanke verpakkingen) of een lagere gezondheid (lage, brede verpakkingen) communiceerde. Deze designelementen werden steeds gecombineerd met congruente of incongruente expliciete informatie – bijvoorbeeld een hoge prijs (een signaal voor kwaliteit) of gezondheidsclaims (een signaal voor gezondheid). Er werd gevonden dat verpakkingsdesign over het algemeen een additief effect had op perceptie van producteigenschappen. Dat wil zeggen dat verpakkingsdesign in de meeste gevallen effect had op de perceptie van producteigenschappen, onafhankelijk van de (congruente of incongruente) expliciete informatie die tegelijkertijd werd aangeboden. Dit additieve effect van design leek sterker te worden naarmate het expliciete signaal een lagere informatieve (voorspellende) waarde had voor de producteigenschap. Wanneer bijvoorbeeld prijs als expliciete kwaliteitssignaal werd gebruikt, verdween het effect van prijs volledig en beïnvloedde alleen verpakkingsdesign kwaliteitsperceptie. Wanneer de marktpositie van het merk – een signaal met een hogere informatieve waarde voor kwaliteit – als expliciet signaal werd gebruikt, resulteerde dit in significante effecten voor zowel merk als verpakkingsdesign. Wanneer een expliciet signaal met een nog hogere informatieve waarde werd gebruikt (productclaims), verdween het effect van verpakkingsdesign op perceptie van producteigenschappen.

Discussie en implicaties

In deze dissertatie is het effect van verpakkingsdesignelementen op perceptie van voedingsproducteigenschappen onderzocht. Tot recentelijk heeft de wetenschap zich vooral gericht op verpakking als een medium dat expliciete persuasieve informatie overdraagt, zoals claims of logo's. Deze dissertatie benadrukt de symbolische en metaforische effecten van verpakkingsdesign op de perceptie van producteigenschappen. Hiermee verschaft het een waardevolle bron van informatie over hoe theorieën met betrekking tot informatieverwerking zijn toe te passen op de manier waarop productverpakkingen consumenten beïnvloeden in hun product-evaluaties en -keuzes.

Er wordt aangenomen dat consumenten verpakkingsdesign automatisch op heuristische wijze cognitief verwerken. Toekomstig onderzoek zou zich kunnen richten op de vraag of de effecten van verpakkingsdesign sterker worden in situaties waar cognitieve belasting hoog is, zoals ook het geval is in drukke winkelomgevingen. Omdat consumenten informatie oppervlakkiger verwerken wanneer cognitieve belasting hoog is, worden de effecten van verpakkingsdesign op consumentengedrag in deze situaties mogelijk nog sterker. Deze dissertatie richt zich op effecten van verpakkingsdesign op de perceptie van producteigenschappen van producten en merken waar de consument niet bekend mee is. Hoewel deze methode voorkomt dat er versturende effecten ontstaan van bestaande merkkennis op productevaluaties, is nu nog niet duidelijk in hoeverre verpakkingsdesign productevaluaties beïnvloedt voor merken waar de consument al bekend mee is. Mogelijk zijn effecten van verpakkingsdesign minder sterk wanneer het merken betreft die al een duidelijke identiteit hebben ontwikkeld. Toekomstig onderzoek zou zich hierop kunnen richten.

Het impliciete karakter van verpakkingsdesign als persuasief signaal roept vragen op die van ethisch belang kunnen zijn. Net als andere vormen van reclame is het doel van verpakkingsdesign om de manier waarop consumenten een product ervaren en evalueren te beïnvloeden. In het geval van design is het echter erg aannemelijk dat consumenten zich niet bewust zijn van het feit dat zij worden beïnvloed. Dit schaadt de autonomie van consumenten en beperkt hen in het maken van geïnformeerde keuzes over hun consumptie. Ook kan het strategisch gebruik van verpakkingsdesign elementen leiden tot mogelijke misleiding van de consument. Door het gebruik van suggestieve vormen van design, zoals een verpakkingsvorm die gezondheidsassociaties oproept, kan consumenten onterecht de indruk worden gegeven dat een product bepaalde eigenschappen bevat. Dit soort misleiding zou moeten worden voorkomen.

Onderzoek naar de rol van verpakkingsdesign op perceptie van producteigenschappen was tot nu toe grotendeels gebaseerd op anekdotisch en exploratief bewijs. In het ontwerpproces van verpakkingen laten designers zich vaak meer leiden door een 'onderbuikgevoel' dan door systematisch bewijs voor de effectiviteit van een design. In de praktijk wordt de effectiviteit van een verpakkingsdesign

vaak getest door verschillende designs te testen die op meer dan één element variëren. Deze dissertatie toont aan hoe systematische manipulatie van designelementen perceptie van producteigenschappen beïnvloedt en hoe deze interacteren met andere soorten informatie. Dit is onderzocht voor verschillende productcategorieën en verschillende designelementen. Hierdoor verschaft deze dissertatie ons kennis over hoe geïsoleerde verpakkingsdesignelementen productperceptie beïnvloeden en kunnen conclusies worden getrokken over effecten van designelementen die breder toepasbaar zijn. Deze bevindingen bieden een startpunt of handvat voor designers en brandmanagers die specifieke productattributen, zoals kwaliteit en gezondheid, juist wel of niet willen communiceren. Er is aangetoond dat verpakkingsdesign niet slechts een medium is om expliciete signalen mee te communiceren, maar dat verpakkingsdesign zelf communicatieve waarde heeft.

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