Communicating through a congruent multisensory packaging design

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The effect of interaction between shape, texture and weight on taste and product evaluation

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Abstract

Packaging design plays an important role in the decision-making process of consumers. Since a product packaging can really act like a 'salesman on the shelf', it is commonly used as a marketing and communication tool to influence consumer responses and evaluations. The goal of this study is to investigate the effect of the shape of a product, the texture and weight of a package design and their interaction on taste intensity, taste liking, luxury perception, willingness to pay and purchase intention in the food product category chocolate. In addition, the presence and effect of congruency between the variables were measured and explained. This effect was measured through an experiment. The participants were randomly assigned to one of eight package design conditions, consisting of a combination of a symmetrical or asymmetrical shape, a smooth or rough texture and a light or heavy weight. The participants were presented one of packaging designs, after which they received a taste sample and filled in a questionnaire to measure the effect on the dependent variables. Results revealed positive effects of a rough texture and heavy weight on taste intensity and luxury perception and an asymmetrical shape suggest a higher evaluated taste liking. In addition, the interaction between shape and texture and shape and weight positively affect taste intensity. Elaborating on the interaction effects, consumers are willing to pay a higher price for products that are perceived as congruent as opposed to incongruent. In line with these findings a congruent product suggest to have a positive effect on luxury perception. The findings presented prove the importance of using packaging design as a marketing and communication tool. In addition, they show that manipulating shape, texture and weight do influence taste and product evaluation in some way and that congruence as opposed to incongruence results in the suggestion of luxury and a higher willingness to pay.

Keywords: multisensory packaging, sensory congruence, taste evaluation, consumer responses

1. Introduction

Nowadays, consumers have a number of choices while shopping for their everyday goods and groceries, especially in large supermarkets. Almost every product is available from different brands and in different price categories. But what are the reasons to choose one product over the other? How do consumers make decisions in supermarkets and what influences this decision? And how can food manufactures and marketers steer these choices? This article identifies and explains the role of multisensory product packaging on consumer's taste evaluation and purchase intention.

The competition in retail increased a lot over the past years and marketers and product managers have to shift their focus from 'just' the product to the whole consumer experience (Puccinelli, Goodstein, Grewal, Price, Raghubir, Stewart, 2009). Decisions on the purchase of food and beverages are mostly made in store and one of the major factors in impacting purchases is the appearance on the shelf (Grunert, 2016). It is estimated that 73% of the purchase decisions are made at the point of sale and, therefore, the product packaging can act like a "sales man on the shelf" (Rettie & Brewer, 2000). The importance of packaging is evaluated so much, that today package design is proposed to be the fifth 'P' in the marketing mix and it plays an important role in marketing (Nickels & Jolson, 1976).

It is clear that package design has a dual role in consumer decision-making and purchase intention. Product packaging should not only protect and preserve the content, identify the contents, and provide instructions, but it has to market and sell the product. It serves the purpose of positioning the product in line with the marketing strategy of the food producer (Goodman-Deane, Waller, Bradley, Yoxall, Wiggins, Clarkson, 2016; Grunert, 2016). A key component of innovative packaging design consists of positioning the product as a powerful marketing tool, capture the attention of the consumer in the store, to communicate with them, and provide the product with a competitive advantage, compared to all the other products available for consumers (Velasco, Salgado-Montejo, Marmolejo-Ramos & Spence, 2014).

Earlier studies on package design merely focused on visual appearance, but another way to add value to your product is to include multisensory (i.e. engagement of multiple senses) in the package design. Multisensory packaging not only makes a package stand out on the shelf, it can really affect people's judgments of the content and set product expectations (Spence, 2016). A packaging composed of various features such as colour, shape, texture and typographic attributes can help to convey a specific message regarding the contents (Spence, 2012; Velasco et al., 2014). People are influenced in their evaluations by the sensory properties of the product packaging and the meaning attached to these properties (Spence & Piqueras-Fiszman, 2012). Mostly, what a person sees and how he or she feels about packaging, influences what they think about the content. Especially when it comes to taste (Cheskin, 1957; Spence, 2016). To illustrate, packages with more strong and bold colors, communicate a more intense taste and richer flavour experience (Piqueras-Fiszman & Spence, 2012). Furthermore, shape is a visual feature that can communicate certain associations. Ares & Deliza (2010) studied the influence of packaging shape on the taste of yoghurt and reported that a more round container was associated with a creamier taste. Looking into packaging texture Piqueras-Fiszman & Spence (2012) showed that when participants were confronted with a rougher container, the feel of this packaging significantly affected the taste of a digestive biscuit. Another aspect of packaging that plays an important role in taste experience and evaluation is packaging weight. Food that is presented in heavier packages is found to be more intense, satiating and of better quality (Kampfer, Leischnig, Ivens & Spence, 2017). Thus, packaging design aspects play a dual role in influencing the product and taste evaluation of consumers and in decision-making processes.

This study is combining the multisensory aspects of product packaging with the concept of congruency. Prior studies primarily tended to examine the effects of just one attribute of the packaging at the time. For example, Ngo, Misra & Spence (2011) and Deroy & Valentin (2011), studied the effect of different shapes on taste and flavour evaluation. The influence of packaging textures on taste perception (Van Rompay, Finger, Saakes & Fenko, 2016) and on perceived hardness (Becker, Van Rompay, Schifferstein & Galetzka, 2011) has been studied, as well as the effect of changing the weight of a package (Piqueras-Fiszman & Spence, 2012). Thus, there is a need to investigate how

various multisensory attributes interact with each other and whether, and to what extent, this interaction has an effect. Additionally, the rapid developments of technology create possibilities for multisensory packaging design, such as a 3D-printer (Van Rompay et al., 2016). Which makes this an interesting and useful subject of study.

Based on the literature that the packaging of a food product can influence taste evaluation and other consumer responses, this study examines the influence of shape, texture and weight attributes and their interaction. The present study aims to find out whether those attributes and the congruency between those three features have an effect on taste intensity, taste liking, luxury perception, the willingness to pay and purchase intention.

Given the current situation, the relevance of this subject and the gaps in literature, the established research question is as follows:

> *To what extent do multisensory packaging attributes (i.e. shape, texture and weight) influence taste intensity, taste liking, luxury perception, willingness to pay and purchase intention for the food product chocolate and how do these packaging attributes interact with each other?*

This research question studies the independent variables vision (shape) and touch (texture and weight), and especially whether the interaction between them has an influence on the dependent variables. This question will be approached through an experiment. In this research, the product category chocolate will be studied. In the experiment, eight different packaging designs will be compared with each other. The contents stay the same throughout the experiment, but the package of the content will be different, the reaction to this difference will be measured.

In the theoretical framework, a theoretical foundation of the research will be given. The concepts and variables used in the study will be defined and their relationship will be explained.

2. Theoretical framework

Nowadays, consumers are exposed to numerous brands and products when strolling around in a supermarket. All these products have their exclusive packaging design and corresponding elements and cues. Driven by the assumption that the packaging is of influence for consumer product evaluation and decision-making, marketers and food manufactures spend plenty of time and money on product marketing. All with the purpose of positively influencing the consumer. As a result of the interest in this topic, the question arises if a multisensory packaging design can influence consumer responses in a favorable way. In this literature review, the influence of product shape, packaging texture and packaging weight on taste and product evaluation will be discussed. Necessary background information about the independent variables shape, texture and weight, as well as the concept of congruency, will be given. Additionally the dependent variables taste intensity, taste liking, luxury perception, willingness to pay, and purchase intention will be discussed based on existing literature and studies that were conducted previously.

2.1 Multisensory packaging design

For food manufactures and marketers, packaging is considered as a marketing tool and a way of branding. The way we experience and evaluate food is not only determined by the intrinsic features, such as ingredients, but also by extrinsic product features, such as the brand name or the package design (Becker et al., 2011; Piqueras-Fiszman & Spence, 2011). Especially in the evaluation of food products, packaging plays an important role since experience attributes like flavour are only assessable after purchase and consumption (Boulding & Kirmani, 1993). To evaluate a product beforehand and to make inferences regarding experience attributes, consumers have to use cues provided by the package design (Kahneman, 2003; Strack & Deutsch, 2006).

Packaging is described as the container that is in direct contact with the product. It holds, protects, preserves and identifies the content (Ampuero & Vila, 2006). The research of Apuero & Vila (2006) describes three types of packaging. First, primary packaging is packaging that is in direct contact with the product (e.g. perfume bottles). Secondary packaging contains the primary packages and serves to protect the primary package and to identify the product (e.g. the box that holds the perfume bottle). Finally, tertiary packaging contains the primary and the secondary package and serves to distribute, unify and protect the product throughout the commercial chain (e.g. a box that contains several perfume bottles).

Looking at marketing literature and research about packaging design, packaging design is defined as the graphic and structural elements that a package is made of, such as the color, shape, size and texture (Underwood, 2003; Van Ooijen, 2016). The elements of a package design can be divided into structural components (e.g. shape, texture, and material) and graphic components (e.g. logo, typography, and color) and the combinations of those components makes it possible to communicate about product attributes (Ampuero & Vila, 2006). Based on these cues, consumers can create a product expectation.

Moreover, combining different packaging design components make it possible to integrate multisensory marketing into a campaign. Multisensory marketing is defined as marketing that engages the different senses and affects the perception, judgment and behavior of consumers (Krishna, 2012). To illustrate, with a multisensory packaging a marketer can activate the consumers' vision trough color and the consumers' touch through the material. Multisensory packaging has the advantage that it makes the package stand out on the shelf and that it sets product expectations (Spence, 2016). Furthermore, consumers are influenced by different sensory properties and the meaning attached to these properties (Spence & Piqueras-Fiszman, 2012). For instance, a red colored crisp packaging is quickly connected to a salty and natural flavour (Spence, 2016). What a person sees and feels on the outside of a product, influences what a person thinks about the contents inside (Cheskin, 1957; S pence, 2016). Recent studies demonstrate that multisensory interactions play a crucial role in consumers' product perception and experience and therefore should be taken into account when designing product packaging (Piquearas-Fiszman, Harrar, Alcaide & Spence, 2011). To illustrate, adding pigment to an odorous solution increased the intensity of the smell and people evaluated

products with darker colors as smelling more intense than products with lighter colors (Schifferstein & Spence, 2008). Moreover, Zampini, Guest & Spence (2013) studied the influence of auditory cues in the evaluation of an electric toothbrush. Results show that the toothbrush was judged as rougher and less pleasant when the sound level increased. The same effect of auditory cues was found for the perceived crispness of potato chips (Zampini & Spence, 2004) and the perceived carbonation in sparkling water (Zampini & Spence, 2005). Keeping the aim of this study in mind, this study will mainly focus on primary and secondary packing design and its structural components in a multisensory way.

2.2 The concept of congruency

There are different symbolic meanings and attributes of product packages that have an influence on product expectations, experience and purchase intention. Not only the individual product features are of value, previous studies show the importance of congruence, as opposed to incongruence, of symbolic meanings within the marketing mix, since it can positively influence consumer responses (Van Rompay & Pruyn, 2011). Moreover, earlier research showed that consumers have a more positive attitude towards a product when different product cues are presented in a congruent way, instead of an incongruent way (Russel, 2002).

The phenomenon of congruency can be best explained by the processing fluency theory. According to this theory, stimuli that can be processed without effort are experienced as more positive and can influence consumer responses in a favorable way (Reber, Schwarz & Winkielman, 2004; Van Rompay & Pruyn, 2011). Fluent stimuli are also considered as more credible, true and aesthetically pleasing than non-fluent stimuli (Reber & Schwarz, 1999; Reber et al., 2004). Explaining congruency through the processing fluency theory, stimuli that are perceived as congruent are easier to process. Due to the fact that fluent processing is perceived as more positive, congruent (i.e. fluent) stimuli are also recognized as a positive experience (Van Rompay & Pruyn, 2011).

Congruent stimuli are not only easier to process, stimuli that are high in congruence are also able to facilitate impression formation. When confronted with products, consumers have to combine different sensory stimuli across product attributes to create an overall impression of the product. The more congruence between modalities, the easier consumers can develop a product impression (Hekkert, 2006). Those sensory stimuli are considered as congruent when the stimuli across different modalities match with each other. This is also known as cross modal correspondence (Spence, 2011). Research showed the existence and effects of crossmodal correspondences that may be used to transfer information about the taste or smell of a product based on non-gustatory features such as colors (Piquearas-Fiszman & Spence, 2011), sounds (Knöferle & Spence, 2012) and shapes (Deroy & Valentin, 2011; Velasco et al., 2014). For example, when buying perfume, the consumer cannot immediately smell the fragrance so he or she is forced to create an impression based on other modalities. Considering this issue, a study of Sharf & Volkmer (2000) demonstrated that packaging color has a significant effect on the consumers' expectations towards perfume intensity, sweetness and freshness. For instance, a dark red package is considered to contain a more intense perfume than a pastel green package (Scharf & Volkmer, 2000). Moreover, multisensory packages that are congruent with the product or brand appear to create a more positive product experience (Schifferstein & Spence, 2008). To illustrate, the taste of 7-Up was evaluated more positively when yellow was added to the original green can (Hine, 1995) and the taste of water was evaluated better when served in a firm cup instead of a flimsy cup (Krishna & Morrin, 2008).

In the present study, the effect of congruence between two modalities (i.e. vision and touch) will be measured through packaging attributes (i.e. shape, texture, and weight) on taste intensity, taste liking, luxury perception, the willingness to pay, and purchase intention. Previous studies show that the combination of these modalities is an interesting approach for research. A study by Labbe, Pineau & Martin (2013) about the influence of packaging design on perceived food naturalness showed that touch contributed for 55% and vision for 24% to the evaluation of a package. Additionally a study by Fenko, Schifferstein & Hekkert (2010) demonstrates that vision (i.e. color) and touch (i.e. material) equally contributed to the evaluation of warmth. Basically, vision and touch show an overlap in terms of the information they may provide; people can both see and feel the shape or the texture of an object (Schifferstein & Spence, 2008).

Whereas individual packaging attributes can steer specific taste evaluations, the congruency between different attributes is expected to affect overall taste and product experience and evaluations in a positive manner (Reber, Wurtz & Zimmermann, 2004). There is already evidence that shows that congruency between different sensory attributes has a positive influence on consumers' emotions (Salgado-Montejo, Velasco, Olier, Alvarado & Spence, 2014). This study will explore the concept of congruency even further and test if these previous findings will hold in the present study.

It is expected that congruency between the shape, texture and weight of package design will have a positive influence on the taste and product evaluation of consumers. Hence, the following hypotheses are formulated:

H1a: Congruency between the shape, texture and weight of a package design positively influences the taste intensity of the product.

H1b: Congruency between the shape, texture and weight of a package design positively influences the taste liking of the product.

H1c: Congruency between the shape, texture and weight of a package design positively influences the luxury perception of the product.

H1d: Congruency between the shape, texture and weight of a package design positively influences the willingness to pay for the product.

H1e: Congruency between the shape, texture and weight of a package design positively influences the purchase intention of the product.

2.3 The influence of shape

Senses play an important aspect in how consumers perceive products. Of the five senses, vision and touch provide the most detailed information about a product and olfaction the least (Schifferstein & Cleiren, 2005). In this paragraph the concept of vision will be further explained and is implemented in the form of product shape in this present study.

A general assumption in visual perception is that the eyes and brain work together to form an image of people's environment and surroundings (Wedel & Pieters, 2008). There are different types of visual cues (e.g. color and geometric cues) and these cues can have various goals (e.g. drawing attention, providing information or an aesthetic goal) (Krishna & Elder, 2010). Furthermore, vision can be helpful to experience and define other senses. Vision can complement another sense by providing the brain with information that the other sense cannot provide. To demonstrate, an object can be divided into geometry (e.g shape) and material, our vision is able to quickly provide information about geometry, but material properties are better accessed by touch (Klatzky, 2010).

When shopping for food or beverages consumers often base their decisions on the visual appearance of the product (Fenko et al., 2010; Becker et al., 2011). Hence, product packaging can drive product evaluation and consumer decision making since it allows consumers to draw inferences about the product, the product attributes and its taste all based on its visual appearance (Becker et al., 2011).

2.3.1 Product shape

According to some marketers and researchers, product or packaging shape is connected to tactile branding (Lindstrom, 2005). However, consumers nearly always use their vision before picking up a product (Juravle, Velasco, Salgado-Montejo & Spence, 2015). In addition, the fact that people are visually dominant makes it likely that seeing the shape of a product or packaging has a greater impact on consumers' expectations and experiences than actually feeling the shape (Spence, 2016). Consumers usually have a visual experience by seeing a color or shape before feeling a product. Those visual cues influence and dominate the subsequent experience (Piqueras-Fiszman & Spence, 2015). Therefore, vision is implemented through product shape in this present study.

Earlier studies show that the shape of a product or packaging has an influence on taste experience and consumer behavior. Any shape that is presented close to, or on, a food or beverage product can be used by consumers to determine the qualities of that food product, this undoubtedly influences consumer behaviour (Van Doorn, Woods, Levitan, Wan, Velasco, Bernal-Torres & Spence, 2017). Additionally, Spence & Deroy (2014) stated that flavours and tastes are related to the representations of shapes and seeing certain shapes can elicit and prime representations of flavours and tastes.

In recent years, there has been a growing interest in matching shapes to tastes. Ngo, Misra & Spence (2011) manipulated the shapes of product packaging and found that the bitterness of chocolate is linked to sharper and more angular shapes and the sweetness of chocolate is associated with round shapes. Additionally, Deroy & Valentin (2011) investigated the correspondence between shapes and flavours of beer. The participants in this study had to taste different beers and had to match them to a certain shape. Results show that the participants associate sweeter beers with more rounded and voluminous shapes and acidic beers with flatter shapes. Furthermore, the results of a study by Zhang, Feick & Price (2006) show that angular shapes lead to strong taste associations and round shapes to mild taste associations. Because of existing conventions in the marketplace, and as shown in several studies, there is a high level of conceptual association between certain tastes (e.g. sweetness) and shapes (e.g. round) (Velasco, Wan, Knoeferle, Zhou, Salgado-Montejo & Spence, 2015; Velasco, Woods, Petit, Cheok & Spence, 2016).

Research on the influence of shapes on tastes mostly focused on abstract visual shapes, curvature and shape contour (Spence & Gallace, 2011; Ngo, Misra & Spence, 2011; Becker et al., 2011; Velasco et al., 2016). Meanwhile, other shape features that affect visual preferences and may influence taste associations, such as the level of symmetry, have rarely been studied. During the evolution, symmetry of shape has been used as a sign of biological fitness, overall quality and aesthetically pleasantness. Therefore, it is likely that the presence of symmetry across different contexts means that this visual feature is going to be associated with a positive valance and that symmetry is preferred over asymmetry (Salgado-Montejo, Alvarado, Velasco, Salgado, Hasse & Spence, 2015).

Additionally, the influence of the symmetry of shape can be linked to the fluency hypothesis (Reber & Schwarz, 1999). This hypothesis states that people are sensitive to the efficiency of cognitive processes and that a high level of fluency results in a positive affect (Reber, Wurtz & Zimmermann, 2004). One of the visual features that is known to influence human information processing, is symmetry (Reber, Schwarz & Wienkielman, 2004). Symmetric patterns tend to be recognized more rapidly and are less resource-intensive and more efficient to process compared to random or asymmetric patterns (Reber et al., 2004; Makin, Pecchinenda & Bertamini, 2012). A study by Turoman, Velasco, Chen, Huang & Spence (2017) manipulated the symmetry of shapes to measure this influence on shape-taste correspondence. Results show that the shapes with the highest level of symmetry were perceived as sweeter, more pleasant and less bitter than the more asymmetric shapes. The results found in this study supported the processing fluency account of aesthetic preferences.

Moreover, the effect of symmetry can be studied by the use of the affective mediation hypothesis. This implies that a common affective property of a shape attribute on one hand and a taste on the other hand, will cause the shape and taste to be associated (Turoman, Velasco, Chen, Huang & Spence, 2017). In a study by Salgado-Montejo et al., (2015) participants were asked to match shapes with tastes. The study demonstrates that more symmetric shapes were matched with words like pleasant and sweet. Shapes that were more asymmetrical were more consistently matched with the words unpleasant and sour. This evidence suggests that besides curvature, the symmetry of shape influences valence and taste categorization (Salgado-Montejo et al., 2015). In line with these results, Jacobsen, Schuhotz, Höfel & Cramon (2006) show that symmetry has a strong influence in matching shapes to taste words and that symmetry is a positive salient feature.

The present study will not necessarily focus on packaging shape, but rather on the shape of the actual product. It is especially interesting to measure the connection between taste and shape when the exact same food is presented in various shapes (Velasco, Woods, Deroy & Spence, 2015). In this study the shape of the food product will be manipulated into symmetrical and asymmetrical shapes, the actual product and ingredients stay the same throughout the experiment. This will result in a

condition consisting of symmetrical shaped pieces of chocolate (i.e. neat rectangular pieces) and a condition consisting of asymmetrical shaped pieces of chocolate (i.e. demolished chunks).

In existing literature, it is argued that the shape features of products and product packaging influence the expected and evaluated taste. Several existing studies show that there is a connection between the level angularity or curvature and taste evaluation. Furthermore, fluency and symmetry seem to have a positive effect on the emotional judgments of consumers. However, evidence of a direct effect of the symmetry of shape on taste intensity has not been found yet. This study aims to investigate this gap in literature and to investigate if there is indeed a positive effect of symmetry of shape on taste and product evaluation. Thus, the following hypotheses are formulated:

H2a: A symmetrical product shape, as opposed to an asymmetrical product shape, positively influences the taste intensity of the product.

H2b: A symmetrical product shape, as opposed to an asymmetrical product shape, positively influences the taste liking of the product.

H2c: A symmetrical product shape, as opposed to an asymmetrical product shape, positively influences the luxury perception of the product.

H2d: A symmetrical product shape, as opposed to an asymmetrical product shape, positively influences the willingness to pay for the product.

H2e: A symmetrical product shape, as opposed to an asymmetrical product shape, positively influences the purchase intention of the product.

2.4 The influence of texture and weight

Touch is the first sense we develop as children and it is one of the senses that can transmit meaning that cannot easily be transmitted through formal language (Montagu, 1971). Moreover, previous studies show that, what a product feels like can influence the experience consumers have with a product and whether people will buy the product or not (Creusen & Schoormans, 2005; Spence & Gallace, 2011). For these reasons, using touch in packaging design more effectively is interesting for marketing purposes.

Touch is one of the five senses and is processed by the somatosensory system, it is defined by Stevens & Green (1996) as “sensations aroused through the stimulation of receptors of the skin” (p.1). Hence, touch is considered as a contact sense and requires actual contact with an object. Whereas other senses function via a buffer (e.g. olfaction via air), touch enables people to actually feel objects that they come in contact with (Peck, 2010; Spence & Gallace, 2011). Touch can be divided into utilitarian and hedonic touch. Utilitarian touch provides the functional gathering of information about an object, while hedonic touch is used to establish exploration or sensory experience (Peck & Childers, 2003). This study mainly focuses on the hedonic domain.

Keeping the influence of touch in mind, food producers and package designers have to think about changing the feel of a package and the influence of this feature. Product packaging with a certain feel or finish can be an effective marketing tool since it plays a significant role in shopping behavior (Holbrook, 1983). It may encourage consumers to pick up and feel the product, which increases the possibility that the consumer will buy the product (Gallace & Spence, 2014). Especially, if a product differs in a characteristic way on one or more material properties (e.g. texture) consumers are more stimulated to touch a product (Peck, 2010). A previous study showed that feelings of psychological ownership and the willingness to pay for a product increased when consumers touched a product (Peck & Shu, 2009). Whether or not a consumer can touch a product can also affect the confidence in product evaluation. When a consumer experiences pleasurable sensory feedback while touching or picking up a product, their attitude towards the product may be positively influenced (Peck & Childers, 2003). The influence is an implicit process and occurs mainly when product features are experienced in a short timeframe (Schifferstein, 2009).

2.4.1 Packaging texture

Besides the influence of touch on the willingness to pay, purchase intention and general product evaluation, the product experience of a consumer is greatly affected by the material of the product packaging. Each package has a different material and texture and those provide all a different feeling. The sensory features of a package have an effect on the experience and evaluation of the contents within that package (Schifferstein, 2009). Especially the taste perception is influenced by the texture of a package design (Van Rompay et al., 2016). To demonstrate, a study shows that a healthy looking material improved the expected healthiness of the tested food product (Lith, 2015). Moreover, a study by Brown (1958) showed that the perceived freshness of bread increased when wrapped in paper with a crispy sound and a dessert was experienced fresher when served in a smooth glass bowl. Furthermore, results of a study by Piqueras-Fiszman and Spence (2011) demonstrate that biscuits scored higher in hardness and crispness when presented in a rough package as opposed to a smooth package. Thus, roughness can be associated with hardness and smoothness with softness. Furthermore, Boring (1942) proposed that different sense sensations share the dimension of intensity. To exemplify, an intense sensation in one sense (e.g. rough feeling package texture) can lead to an intense sensation in another sense (e.g. intense taste) (Becker et al., 2011).

Alongside the influence on taste experience, the texture of a package can also have an effect on product associations. A study by Grohmann, Spangenberg, and Sprott (2007) demonstrated that tactile input influenced people's product evaluations. Especially, in the evaluation of products with characteristics that were best explored by touch. Furthermore, a previous study investigating the effect of texture on body care products showed that texture has a positive influence on utilitarian products and that rough packaging texture, as apposed to a smooth texture, is associated with a more luxurious product (Berends, 2016). Moreover, Schifferstein (2009) claims that for many attributes, the product and taste evaluation follows the tactile experience. Meaning, that it is likely that consumer responses follow the physical characteristics of the packaging design. Therefore, it is possible that when a rough texture is associated with good quality or luxury, the product itself will also be associated with those features.

Guided by the literature above that suggests that texture has an influence on taste and product evaluation, it is assumed that the perceived smoothness or roughness of the packaging will have an effect on the independent variables of this study. Therefore, the following hypotheses are formulated:

H3a: A rough texture, as opposed to a smooth texture, positively influences the taste intensity of the product.

H3b: A rough texture, as opposed to a smooth texture, positively influences the taste liking of the product.

H3c: A rough texture, as opposed to a smooth texture, positively influences the luxury perception of the product.

H3d: A rough texture, as opposed to a smooth texture, positively influences willingness to pay for the product.

H3e: A rough texture, as opposed to a smooth texture, positively influences the purchase intention of the product.

2.4.2 Packaging weight

Besides packaging texture, the weight of a package or product is also a studied concept and known to enhance the feel of a package (Spence, 2016). According to Piqueras-Fiszman & Spence (2012) the weight of a packaging is crucial to modulate the consumer product experience.

Over the last years, several studies investigated the influence of the weight of containers and packages on food experience and taste perception. To illustrate, Piqueras-Fiszman, Harrar, Alcaide & Spence (2011) showed that yoghurt samples consumed from heavier bowls were evaluated as more dense and satiating than identical yoghurt samples from lighter bowls. Additionally, the perceived liking and quality of the food increased as the weight of the bowl increased. By viewing different studies, it is clear that food products that are presented in heavier containers or packaging are rated as more satiating, more dense, of better quality, and it has a positive influence on product liking (Lindstrom, 2005; Piqueras-Fiszman et al., 2011; Piqueras-Fiszman & Spence, 2012). Furthermore, there exists a strong correlation between heaviness, quality and expenses across a diverse range of product categories (Piqueras-Fiszman et al., 2011; Spence, 2016). Thus, heavier products, as apposed to lighter products, are considered as products of better quality and therefore the willingness to pay for those products will increase.

A more recent study of Kampfer, Leischnig, Ivens & Spence (2017) measured the effect of packaging weight on flavour intensity, flavour evaluation and the willingness to pay for a food product (i.e. chocolate) and a beverage (i.e. soft-drink). The results show that packaging weight is positively associated with perceptions of flavour intensity. The heavier the packaging, the more intense the flavour was perceived. Additionally, the higher experienced intensity had a positive effect on the overall flavour evaluation and subsequently on the desire for the food product and the willingness to pay (Kampfer et al., 2017). The underlying idea of this study comes from literature about sensation transference. To illustrate, an intense sensation in one modality can influence and increase the perceived intensity in another sensation modality (Gatti, Bordegoni & Spence, 2014). Additionally, external cues such as packaging and container size has an impact on taste perception and evaluation (Wansink & Park, 2001). The experience of heaviness can increase flavour intensity, which subsequently can enhance flavour evaluation and result in positive consumer responses such as purchase intention (Kampfer et al., 2017).

Concerning the existing literature on the influence of weight on food and beverage products, the following hypotheses are formulated:

H4a: A heavier package, as opposed to a lighter package, positively influences the taste intensity of the product.

H4b: A heavier package, as opposed to a lighter package, positively influences the taste liking of the product.

H4c: A heavier package, as opposed to a lighter package, positively influences the luxury perception of the product.

H4d: A heavier package, as opposed to a lighter package, positively influences the willingness to pay for the product.

H4e: A heavier package, as opposed to a lighter package, positively influences the purchase intention of the product.

2.5 Taste intensity & taste liking

Taste and flavour perception of food and beverage products is one of the most multisensory experiences people can have and the sense in which one can see the largest individual differences (Chen & Engelen, 2012). The human taste perception can be distinguished between five different tastes; sour, salty, sweet, bitter and umami (Ikeda, 2002). Despite the fact that people consume food on a regular basis, it is hard to differentiate one taste from another using only the sense of taste (Krishna, 2012). Without for instance smelling or seeing the food, it is difficult to tell the difference between a potato and an apple (Herz, 2007).

Considering the fact that how something tastes is influenced by other senses as well, the other aspects of a food product are just as, or maybe even more, important as the product itself. To demonstrate, food preference starts with vision and olfaction and ends in taste sensations (Berkowitz, 1987). Someone first sees or feels a product, before putting it in their mouth and tasting it. As proposed by Gibson (1966), taste should be seen as a perceptual modality and not as a sensory modality. There are two approaches to define our perceptions, the modal approach and the amodal approach. According to the first one, our perceptions are based on sensations and are linked to a specific sensory modality by which they were generated (Gibson, 1966; Auvray & Spence, 2008). In line with this view, flavour is not a separate sensory modality, but a perceptual modality that is unified by eating a food product (Auvray & Spence, 2008). Moreover, this sensory experience is often subjective, since it is influenced by factors as personal memory, beliefs and expectations (Enax & Weber, 2015).

Whether we like a product or not is also closely connected to the design of that product (Schifferstein, Fenko, Desmet, Labbe & Martin, 2012). Consumers have certain taste expectations by examining the package through text, colour and images (Cardello, 1994). Those feelings tend to influence what people say about the product itself, especially in taste evaluation (Cardello, 1994; Becker et al., 2011; Spence, 2016). This indicates that packaging design, and especially multisensory packaging design, affects people's expectations and evaluations concerning the taste of a product. Product evaluation is described as the awareness of the psychological effects by interacting with a product. It includes the way all our senses are stimulated, the meaning we attach to a product and the feelings that are elicited (Fenko et al., 2009).

Past research already showed to influence of the appearance of a product on taste evaluation. A study by Lee, Frederick & Ariely (2006) demonstrated that the experienced taste of a food product (i.e. beer) differentiated whether the participants were shown a label with the ingredients before, during or after tasting the sample. Looking into the concept of haptic sensations, a more angular packaging shape creates a more intense taste in the evaluation of yoghurt (Becker et al., 2011) and the roughness of the texture of a cup can influence the perceived bitterness or sweetness of coffee (Van Rompay et al., 2016). This research implies that the packaging sets certain expectations and can influence the actual perceived taste of a product. This carry-over effect of a package design to taste evaluation is also known as sensation transference or affective ventriloquism (Cheskin, 1957; Spence & Gallace, 2011). Furthermore, this concept can be connected to the earlier discussed cross modal correspondence. Where attributes from one modality (e.g. package design) tend to match with attributes from another modality (e.g. product taste) (Spence, 2011).

The evidence that shows that packaging design has an influence on taste experience is of high value in the present shopping environment. Consumers have to make taste assumptions at the critical point of purchase despite the fact they have no real experience with the taste of the product yet. They can only make these assumptions based on the appearance of the product and its physical properties (Schifferstein et al., 2013). In addition, the package design of a food product, not only influences the taste experience it also confirms already made taste expectations. Thus, the actual taste experience and evaluation is of high importance, since it determines whether the consumer is satisfied with his or her purchase decision (Lee et al., 2006).

In the present study the effect of shape, texture, weight and their interaction will be measured on taste evaluation in the form of taste intensity and taste liking. The taste intensity refers to the power of the concentration of the food product (Stevens, 1969) and the taste liking refers to the way the participants perceive the general taste and flavour of the food product.

2.6 Luxury perception, purchase intention and willingness to pay

One of the goals of this study is to measure the effect of the independent variables, and the interaction between those, on buying behavior. In this study this will be measured through the dependent variables luxury perception, purchase intention and the willingness to pay for a product.

In supermarkets nowadays, where a lot of products are offered and where there is a wide variety of choice, product expectations, purchase intentions and ultimately decisions are not based on a long process and systematic evaluation of attributes, but mostly on heuristic, "fast and frugal", processing of packaging cues (Dijksterhuis, Smith, Van Baaren, & Wigboldus, 2005). Consumers are likely to base their intentions and decisions on explicit cues, such as price and product claims, as well as subtle cues that are communicated by packaging design, such as colour, shape and texture. Moreover, product design attributes are more likely to be processed automatically and unconsciously when a product is considered for purchase than explicit attribute cues (Van Ooijen, 2016).

The packaging design especially plays a role in identifying the category and brand to which a product belongs and in attaching meaning to the product (Schifferstein et al., 2012). This can be helpful in the identification and evaluation of the product itself (Piquearas-Fiszman & Spence, 2011). Additionally, packaging design helps in making the product stand out from the competition on the shelf, which can positively affect purchase intention (Schifferstein et al., 2012). Furthermore, consumers infer product expectations as quality and luxury relying on packaging cues and believe that luxury goods communicate symbolic elements that give them personal benefits. Also, consumers look for distinctive cues when deciding to buy a product that communicates abstract benefits such as luxury, quality or status (Audrin, Brosch, Chanal and Sander, 2017). To summarize, the package of a product, including all its cues, can be a driver for the product expectations, purchase intention and decision-making since consumers draw inferences about the product and its taste. Not to mention, the fact that consumers perceive a product as more luxurious or of higher quality may increase the willingness to pay and actually spending this money on luxury products can have a positive impact on someone's well being (Hudders & Pandelaere, 2015).

From another point of view, previous research shows that if a package matches the actual content, the purchase intention and price consumers are willing to pay will increase (Morwitz, Steckel & Gupta, 2007). This can be explained by the findings that fluent processing positively influences product evaluations (Lee & Labroo, 2004; Van Rompay & Pruyn, 2011). Products that are perceived as congruent lead to a more favourable response, which in turn has a positive effect on the price expectations and the price consumers eventually are willing to pay (Van Rompay & Pruyn, 2011). Additionally, congruence between different modalities has a positive influence on the overall evaluation of products, which can ultimately lead to a better decision-making process. This is also known as cross modal correspondence (Hekkert, 2006; Spence, 2011; Spence & Parise, 2013). In other words, people try to match attributes from one modality (e.g. package design) to attributes from another modality (e.g. product taste). To illustrate, people consider a round shape and a sweet taste as cross modal congruent. So when a sweet tasting product is wrapped in a more round container, the purchase intention an the price people are willing to pay will be higher due to the congruency and fluent processing in the consumers mind.

Due to the findings that state that packaging design has a great influence on product expectations such as luxury and on purchase intention this variable, as well as the price consumers are willing to pay for a product, will be analysed in this study. The present study will also focus on the interaction and effect of congruency between different subtle packaging cues on the consumers purchase intention and willingness to pay. Therefore, it is expected that the presence of congruency in a packaging design will have a positive influence on purchase intention and will increase the price consumers are willing to pay for a product.

3. Method

The purpose of this study is to investigate whether the multisensory package design attributes have an effect on the consumers taste intensity, taste liking, luxury perception, willingness to pay and purchase intention. The effect of the separate independent variables, shape, texture and weight, will be the first step of this study. In addition, the presence and effect of congruency between the three independent variables is measured. The second step of this study will examine this effect. This section elaborates and justifies the methods of this research. The research design is explained first, followed by the stimulus material and the pre-test.

3.1 Research design

This study aims to find out what impact shape, texture and weight have on taste intensity, taste liking, luxury perception, willingness to pay and purchase intention. The research design used in this study is a two (symmetrical vs asymmetrical shape) by two (rough vs smooth texture) by two (light vs heavy weight) design. This results in eight manipulated conditions. In the experimental design, participants can be allocated into different groups with different conditions who can be controlled.

Furthermore, the distinction in shape, texture and weight determines whether there is a degree of congruency between the packaging attributes. Three levels of congruency are created for this study, namely *extreme congruent, congruent on touch* and *incongruent*. An extreme congruent condition means that the independent variables in this condition fit together perfectly. To illustrate, a symmetrical shape, a smooth texture and light weight communicate the same message in this study, as well as an asymmetrical shape together with a rough texture and heavy weight. In the congruent on touch conditions, the two independent variables that address to haptic sensations fit together and the third variable addressing to vision does not fit well with the other two. To exemplify, condition 5 consists of a rough texture and heavy weight, that both communicates the same message via touch, the symmetrical shape communicates the opposite effect through vision and therefore this condition is not completely congruent. Finally, the incongruent condition means that the three independent variables do not fit together at all and do not communicate the same message. To illustrate, condition 3 consist of a symmetrical shape, rough texture and light weight. It can be argued that the shape and weight do communicate the same in this condition, but since they address different senses this combination of variables is considered as incongruent. An overview of the eight conditions and their level of congruency can be found in table 1 below.

Table 1 – overview conditions and level of congruency

	Texture I Smooth		**Texture II** Rough	
	Weight I Light	**Weight II** Heavy	**Weight I** Light	**Weight II** Heavy
Shape I Symmetrical	Condition 1 Extreme Congruent	Condition 2 Incongruent	Condition 3 Incongruent	Condition 4 Congruent on Touch
Shape II Asymmetrical	Condition 5 Congruent on Touch	Condition 6 Incongruent	Condition 7 Incongruent	Condition 8 Extreme Congruent

This study examines in step 1 whether the multisensory features of a package design have an influence on five dependent variables; taste intensity, taste liking, luxury perception, willingness to pay and purchase intention. Also, in step 2 of the study, the experiment measures if there is a level of congruency present between the independent variables and its effect on the dependent variables. The research model can be found in figure 1.

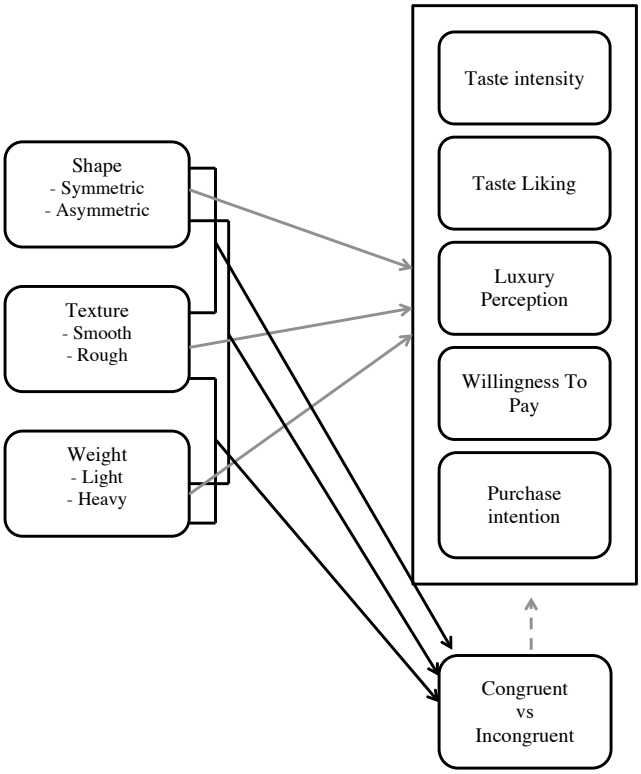

Figure 1. Research model.

3.3 Stimulus materials

For the experiment, eight different packaging designs are created as stimulus material. The designs consist of a (1) symmetrically shaped package with a smooth texture and light weight, (2) a symmetrically shaped package with a smooth texture and heavy weight, (3) a symmetrically shaped package with a rough texture and light weight, (4) a symmetrically shaped package with a rough texture and heavy weight, (5) an asymmetrically shaped package with a smooth texture and light weight, (6) an asymmetrically shaped package with a smooth texture and heavy weight, (7) an asymmetrically shaped package with a rough texture and light weight and (8) an asymmetrically shaped package with a rough texture and heavy weight. The used shapes, textures and weights are determined by a pre-test.

3.4 Pre-test

In order to determine which shapes are perceived as symmetric or not, which textures are perceived as rough or smooth and whether a weight is perceived as light or heavy, a pre-test is conducted. To determine the level of symmetry of a piece of chocolate the participants had to judge two different pictures of chocolate. One of the pictures showed the symmetrical condition, the other the asymmetrical condition. The participants were randomly assigned to one of the two conditions. The level of symmetry was measured by six items that were recorded on a seven-point scale, where 1 = fits very well and 7 = does not fit at all. The items measured are *symmetrical, proportional, equal, unbalanced (r), asymmetrical (r) and unequal (r),* with $\alpha = .73$. The outcome of this part of the pre-test confirmed whether the expected symmetrical condition is actually perceived as symmetrical and vice versa.

Figure 2. Symmetrical shape (left) and Asymmetrical shape manipulation (right).

Beside the shape, the packaging texture needed to be determined. This part of the pre-test contained of two different packages, one with the expected smooth texture and one with the expected rough texture. To find out if this prediction is true, the participants were randomly assigned to one of the packages and asked to view and touch the package. Afterwards the participants had to score different items concerning the texture on a seven-point scale, where 1 = fits very well and 7 = does not fit at all. The items that were measured are *even, plain, smooth, rough (r), bumpy (r) and coarse (r)* with $\alpha = .97$.

Figure 3. Smooth texture (left) and rough texture manipulation (right).

The last variable that needs to be determined is the packaging weight. The pre-test of the weight condition included two different boxes. The light condition had the weight of an average chocolate bar, namely 100 grams. For the heavy condition extra weight was manipulated with lead, this box is 200 grams. The manipulation was not visible to the participants. The participants were randomly assigned to one of the two boxes and asked to score six items on a seven-point scale

where 1 = fits very well and 7 = does not fit at all. The items that were measured are *light, easy to lift, subtle, heavy (r), massive (r) and voluminous (r)*, with $\alpha = .93$. The complete questionnaire used in the pre-test can be found in Appendix 1.

3.5 Results pre-test

In the pre-test a number of 30 people participated, resulting in a number of 15 participants in each condition. 20 Participants were female and 10 participants were male. The participants in this study were between 18 and 59 years old ($M = 30.53$). To determine the final scores for the shape, texture and weight, a report of the results has been made by the use of SPSS.

3.5.1 Shape

At first, the scores for the shape condition were analyzed. The used scale was developed to measure the level of symmetry of the shape on a seven-point scale, ranging from 'fits very well' till 'does not fit at all'. This indicates that a low score stands for a high level of symmetry and a high score stands for a high level of asymmetry. This scale has a relatively high internal consistency, with a Cronbach's Alpha coefficient of .73. When removing the fifth item 'even', the reliability score will be $\alpha = .74$. Which is higher than the final value obtained. In the case of this research it is not necessary to remove this item. Since the Alpha value is above 7 and can therefore be considered reliable with the sample. Results show that there is a clear difference between the mean scores of the symmetrical shape ($M = 3.05$) and asymmetrical shape ($M = 5.39$). This difference is found to be significant $t(15) = 30{,}61$, $p < 0.05$.

3.5.2 Texture

Subsequently, the mean scores and standard deviation of the texture were analyzed. The used scale was developed to measure the level of smoothness on a seven-point scale, ranging from 'very fitted' till 'very unfitted'. This indicates that a low score represents a high level of smoothness and a high score represents a high level of roughness. The scale used for the texture has a high internal consistency with a Cronbach's Alpha coefficient of .97. Removing any of the items will not have positive impact, since this will not change the final obtained value for the better. Looking at the mean scores, a significant difference between the mean scores of touching a smooth ($M = 1.74$) or a rough ($M = 5.30$) texture was found with $t(15) = 33{,}13$, $p < 0.01$.

3.5.3 Weight

Finally the weight manipulation was analyzed. The used scale was developed to measure the level of lightness on a seven-point scale, ranging from 'very fitted' till 'very unfitted'. This indicates that a low score stands for a high level of lightness and a high score for a high level of heaviness. The scale used for measuring the weight has a high internal consistency with a Cronbach's Alpha coefficient of .93. Results show that there is a small difference between the mean scores of touching a light package ($M = 2.26$) or a heavy package ($M = 3.92$). Although, the difference is found to be statistically significant $t(15) = 11{,}37$ $p < 0.05$. An overview of the mean scores and standard deviations of the pre-test manipulations can be found in Appendix 3.

3.6 Conclusion

The pre-test confirmed that the manipulations communicate the message that was expected. The symmetrical shaped pieces of chocolate were perceived as symmetrical, as well as the asymmetrical shaped chunks who were indeed perceived as asymmetrical. Also the texture manipulation communicated the right message, were the smooth texture is acknowledged as smooth and the rough texture as rough. Although the mean scores in the weight manipulation were less convincing, the difference was significant. Therefore, it can be concluded that the light weight is considered as light and the heavy weight as heavy. The eight conditions that will be used in the main study can be created based on the outcomes of this pre-test.

4. Main study

The main study of this research tests how eight different packaging designs are evaluated. A questionnaire is used to measure the constructs that represent the dependent variables, taste intensity, taste liking, luxury perception, willingness to pay and purchase intention. This chapter explains the procedure, participants, measurement instruments and the reliability scores for all constructs.

4.1 Procedure

The participants used in this study are Dutch consumers ranging from 18 till 80 years old. They are approached in the entrance of a local supermarket in Enschede, The Netherlands, and asked to participate in an experiment. The participants were randomly assigned to one of the eight created conditions. In each condition the participants were presented with one of the packaging designs. They were instructed to take the chocolate packaging in their hands and look at it and feel it for as long as they needed. After viewing and touching the package, the participants received a taste sample of the chocolate, presented on a white napkin. The taste samples were identical throughout the experiment and within each condition. After consuming the sample, the participants filled in the questionnaire on a tablet. This was an online questionnaire, created by the online survey software Qualtrics. The questionnaire measured the effect of the independent variables on the dependent variables, the existence and level of congruency, the taste preferences of the participants, and it included a manipulation check. Also, demographic questions were added to obtain more information about the participants. After completing the questionnaire, the participants finished the experiment and were thanked for their cooperation and dismissed.

4.2 Participants

For this experiment, Dutch consumers, male and female with a minimum age of 18 years old were selected. In the main study, 160 participants participated in the experiment. One participant had to be deleted from further evaluation due to his age, which results in a final number of 159 participants. A Chi-square test showed that there were no significant differences X^2 (7) = 1.79, p = .97 between gender in the eight conditions. Additionally, a one-way analysis of variances was conducted to show that there were no significant differences $F(7, 151) = 1.86$, p = .08 between the ages in the conditions. These results show that the eight conditions are similar in terms of participants and therefore can be compared and used for further evaluation. An overview of the participants can be found below in table 2.

Table 2 – descriptive statistics participants

Condition	**N**	**Age**		**Gender**	
		M	SD	Male	Female
1	20	30.15	15.73	55%	45%
2	20	31.75	9.88	45%	55%
3	19	29.53	12.64	40%	60%
4	20	32.55	10.67	40%	60%
5	20	36.10	11.73	40%	60%
6	20	36.25	11.73	45%	55%
7	20	37.45	9.62	50%	50%
8	20	39.23	13.96	50%	50%
Total	159	34.23	12.34	45.6%	54.5%

4.3 Measures

The next step in this study is measuring the effect of the independent variables on taste intensity, taste liking, luxury perception, willingness to pay and purchase intention. The used measures and items are explained in the following section.

4.3.1 Taste intensity and taste liking

To measure the effect of the independent variables on taste intensity and taste evaluation, a set of nine items was formulated. These items measured how the participants perceived the taste of the chocolate sample. A previous study of Becker et al. (2011) is consulted and adapted to this study. The taste intensity and taste evaluation was measured using the items, *bitter, sharp, mild (r), sweet (r), strong, creamy (r), intense, powerful* and *pure,* see Q4 in Appendix 2. Participants had to indicate to what extent they considered these items descriptive for the taste of the chocolate. The responses of the participants were recorded on a seven-point scale, ranging from strongly disagree to strongly agree.

Subsequently, Q5 in Appendix 2 contains the items to measure general flavour evaluation and taste liking based on studies of Allen, Gupta & Monnier (2008) and Fenko, Backhaus & Van Hoof (2015). The items included *good taste, flavoursome, this chocolate is pleasant to eat* and *I like this chocolate*. Participants had to indicate to what extent they considered these items descriptive for the taste of the chocolate sample. The responses of the participants were recorded on a seven-point scale, ranging from strongly disagree to strongly agree.

4.3.2 Luxury perception, purchase intention and willingness to pay

To measure the effect of the shape, texture and weight on the dependent variable luxury perception the participants had to indicate to what extent they considered the statements *chic, everyday, average* and *exclusive* descriptive for the shown package and tasted sample.

To measure purchase intention, a set of three items was formulated. A previous study of Napoli, Dickinson, Beverland, & Farrelly (2014) was consulted for this construct. This study uses the questionnaire as designed by Putrevu & Lord (1994). The questions of the previous study are adapted to the present research. The participants had to indicate to what extent they agreed with the items *I would like to try this chocolate, I will consider buying this chocolate* and *I will recommend this chocolate to my friends* on a seven-point scale, ranging from strongly disagree till strongly agree. The previous items measuring luxury perception and purchase intention can be found in Q6 in Appendix 2.

As additional measure, the price expectations and willingness to pay were included. The participants were confronted with the average price of a chocolate bar in a Dutch supermarket. After obtaining this information they were asked what they thought would be the price of the product used in this study in a Dutch supermarket and what they would be willing to pay for this product, see Q7 and Q8 in Appendix 2. The participants had to fill in their answers in Euro's.

4.3.3 Manipulation check

A set of three items was included as a manipulation check of the independent variables, one item for each variable. The participants had to indicate to what extent they agreed with statements about the shape, texture and weight of the package design. The same statements were used as during the pre-test and responses were recorded on a seven-point scale ranging from "strongly disagree" to "strongly agree", these items can be found in Q9 in Appendix 2.

4.3.4 Perceived congruency

To gain insight in the presence and the level of congruency between the shape, texture and weight of a condition, three questions were formulated. See Q10, Appendix 2. The perceived congruency was measured using the statements *I consider the product and package as a whole, the product and package are consistent* and *the content matches the packaging*. Participants had to indicate to what extent they considered the items descriptive on a seven-point scale ranging from strongly disagree to strongly agree.

4.3.5 Taste preferences

To be able to draw conclusions from the answers given and to explain possible outliers, one has to gain insight in the taste preferences of the participants. Taste preferences and current behavior towards eating chocolate is seen as a mediated effect in the current research and needs to be measured to explain the relation between the independent and dependent variables. To measure the taste preferences, the participants had to indicate to what extent they agreed with the statements *I like strong flavours* and *I like intense flavours*. Subsequently, the participants had to answer the statement *when I eat chocolate, I mostly eat milk chocolate*. These items can be found in Q11 in Appendix 2. The responses of the participants were recorded on a seven-point scale, ranging from strongly disagree till strongly agree. Additionally, the participants had to fill in the how many times a week they consume a piece of chocolate, see Q12 in Appendix 2.

4.4 Reliability

One of the main issues concerning the reliability of the scales included in this study is the scale's internal consistency and whether all the items measure the same underlying construct. The reliability of the scales is calculated according to the Cronbach's Alpha coefficient. Ideally, the Cronbach's Alpha coefficient of a scale needs to be at least .70 to be reliable (Spector, 1992). Table 3 presents the scales used in this study and their reliability scores. All the included scales have a value of at least .89, and therefore can be considered reliable.

Table 3 - Reliability of the constructs

Scale	**Items**	**N**	**α**
Taste Intensity	Bitter	9	.91
	Sharp		
	Mild *(reversed)*		
	Sweet *(reversed)*		
	Strong		
	Creamy *(reversed)*		
	Intense		
	Powerful		
	Pure		
Taste Liking	This chocolate has a good taste	4	.96
	This chocolate is flavoursome		
	This chocolate is pleasant to eat		
	I like this chocolate		
Luxury Perception	This is a chic chocolate	4	.89
	This is a everyday chocolate *(reversed)*		
	This is a average chocolate *(reversed)*		
	This is an exclusive chocolate		
Purchase Intention	I would like to try this chocolate	3	.91
	I will consider buying this chocolate		
	I will recommend this chocolate to my friends		
Congruency	I consider the product and package as a whole	3	.97
	The product and package are consistent		
	The content matches the packaging		

5. Results

This study examines three factors of multisensory packaging design, namely the shape of the product and the texture and weight of the package. These independent variables lead to eight created conditions that were supposed to influence the dependent variables, taste intensity, taste liking, luxury perception, willingness to pay and purchase intention. The results can be found in the following section. To identify the effect of the packaging manipulations, a multivariate analysis of variance with $\alpha = .05$ is used (step 1 of the study). Furthermore, a multivariate analysis of variance is conducted to examine the effect of congruency on the dependent variables (step 2 of the study).

Before analyzing these results of the study, a correlation table between the dependent variables will be given. Additionally, a couple of analyses were conducted in SPSS to obtain more information prior to the multivariate analyses of variances.

5.1 Correlation between the independent variables

A correlation analysis was used to explain the direction and strength of the relationship between the five dependent variables. The relationship between taste intensity, taste liking, luxury perception, purchase intention and willingness to pay was investigated using the Pearson product-moment correlation coefficient. Results show that there was a positive correlation between the variables. The r-values and therefore the strength of the relationship between the variables can be found in table 4.

Table 4 – Correlations between independent variables

Measures	**1**	**2**	**3**	**4**	**5**
1. Taste Intensity					
2. Taste Liking	.15				
3. Luxury Perception	.32**	.25**			
4. Purchase Intention	.19*	.76**	.42**		
5. Willingness to Pay	.23**	.38**	.53**	.49**	

* Correlation is significant at the 0.01 level
** Correlation is significant at the 0.05 level

5.2 Multiple Regression analysis

In addition to the correlation analysis a stepwise multiple regression analysis was conducted to investigate whether taste liking, taste intensity, luxury perception and the willingness to pay are a predictor for the dependent variable purchase intention. At first, results show that the adjusted R square has a value of $R^2 = .64$, meaning that the model explains 64% of the variance in purchase intention. This result is also statistically significant $F(4, 155) = 71.35$, $p < 0.01$. Furthermore, the different variables are compared to investigate which of the variables contributed to the prediction of purchase intention. The model showed that the variable taste liking makes the strongest contribution to purchase intention, $\beta = .64$, $t = 12.11$, $p = < 0.01$. Likewise, luxury perception $\beta = .14$, $t = 2.25$, $p = < 0.05$ ($p = .03$) and the willingness to pay $\beta = .19$, $t = 2.89$, $p = < 0.01$ both contributed to the prediction of purchase intention. For the variable taste intensity, no significant unique contribution was found. The results of the multiple regression analysis are presented in Appendix 3.

5.3 Willingness to pay

In the questionnaire followed by the experiment, the participants were asked about the price in euro's they were willing to pay for the product. To investigate whether the scores differ among the three levels of congruence and whether the participants wanted to pay a higher price for a congruent condition, a one-way analysis of variances was conducted. The analysis showed a significant difference between the *extreme congruence, congruence on touch* and *incongruence* condition $F(2, 157) = 3.91, p < 0.05$ ($p = .02$). Analyzing the mean scores, the participants in the extreme congruent condition were willing to pay the highest price, namely €1,57. Subsequently, in the congruent on touch condition €1,50 and €1,34 in the incongruent condition. Thus, the results indicate that the participants were willing to pay a higher price for a product with a more congruent packaging design. Complete congruence results in the highest willingness to pay. However, even a not extreme level of congruence (i.e. congruence between two of the three attributes instead of all three) will result in a higher willingness to pay than complete incongruence.

Table 5 – One-way ANOVA willingness to pay

Factor	**F**	***P***	**M**	**SD**
	3.91	.02		
Extreme Congruence			1.57	.46
Congruence on Touch			1.50	.48
Incongruence			1.34	.44

5.4 Step 1 of the study

This part of the results section contains step one of the study. In this section, the manipulation check for shape, texture, and weight can be found. Subsequently, the effects of the separate independent variables on taste intensity, taste liking, luxury perception, willingness to pay and purchase intention are analyzed and explained. An overview of the results of the multivariate analysis of variance can be found in Appendix 3.

5.4.1 Manipulation Check

At first, a manipulation check was carried out prior to conducting the main analysis. This manipulation check verifies if the experimental manipulation worked and is understood by the participants. A one-way analysis of variance was conducted to determine the effectiveness of the shape manipulation. The analysis shows a significant difference $F(1, 157) = 373.68, p < 0.01$ between the symmetrical shape ($M = 6.22, SD = 1.28$) and the asymmetrical shape ($M = 1.74, SD = 1.62$).

Subsequently, the manipulation check for the experimental manipulation of the texture shows a significant difference $F(1, 157) = 140.93, p < 0.01$ between the smooth texture ($M = 5.38, SD = 1.98$) and the rough texture ($M = 1.88, SD = 1.68$).

Finally, the last manipulation check for the experimental manipulation weight shows a significant difference $F(1, 157) = 250.18, p < 0.01$ between the light weight ($M = 5.34, SD = 1.72$) and the heavy weight ($M = 1.65, SD = 1.17$).

5.4.2 Shape effects

To investigate whether the shape of a chocolate product has an effect on taste intensity, taste liking, luxury perception, willingness to pay and purchase intention, a multivariate analysis of variance was conducted. First, results show no significant main effect of shape $F(1, 151) = .84$, $p = .52$. Furthermore, looking at the effect of shape on the different dependent variables, results showed no significant main effect of shape on taste intensity, luxury perception, willingness to pay and purchase intention. Nevertheless, a marginally significant effect of shape on taste liking was found $F(1, 151) = 2.93$, $p < 0.1$ ($p = .09$). Where, the mean of the asymmetrical shape condition ($M = 5.32$, $SD = 1.36$) is larger than the mean of the symmetrical shape condition ($M = 4.97$, $SD = 1.20$).
Thus, these results suggest that product shape can have an effect on taste liking, where the participants experienced a more pleasant taste in the asymmetrical shape condition. Figure 4 shows the effect of product shape on taste liking.

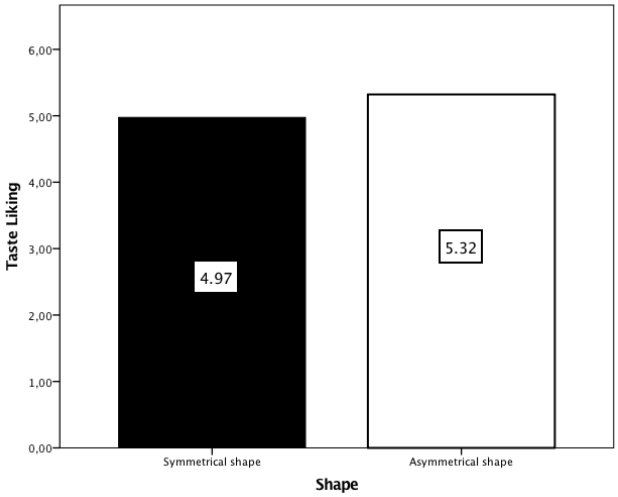

Figure 4. Shape on Taste Liking.

5.4.3 Texture effects

Subsequently, the effect of texture on the dependent variables was investigated by the use of a multivariate analysis of variance. To begin with, texture has a significant main effect $F(1, 151) = 2.93$, $p < 0.01$. Further investigation shows no significant main effect for taste liking, willingness to pay and purchase intention. However, the results show a significant main effect for taste intensity $F(1, 151) = 12.74$, $p < 0.01$, where the mean of the rough texture condition ($M = 3.48$, $SD = 1.30$) is larger than the mean of the smooth texture condition ($M = 2.95$, $SD = .93$). Furthermore, results show a significant main effect for luxury perception $F(1, 151) = 5.70$, $p < 0.05$ ($p = .02$). Where the mean of the rough texture condition ($M = 3.94$, $SD = 1.43$) is larger than the mean of the smooth texture condition ($M = 3.40$, $SD = 1.43$). According to this analysis, the packaging texture has an effect on taste intensity and luxury perception, whereby the taste is perceived more intense and the product more luxurious in the rough texture condition. Figure 5 demonstrates how the effect of taste intensity and luxury perception is distributed among the smooth and rough texture.

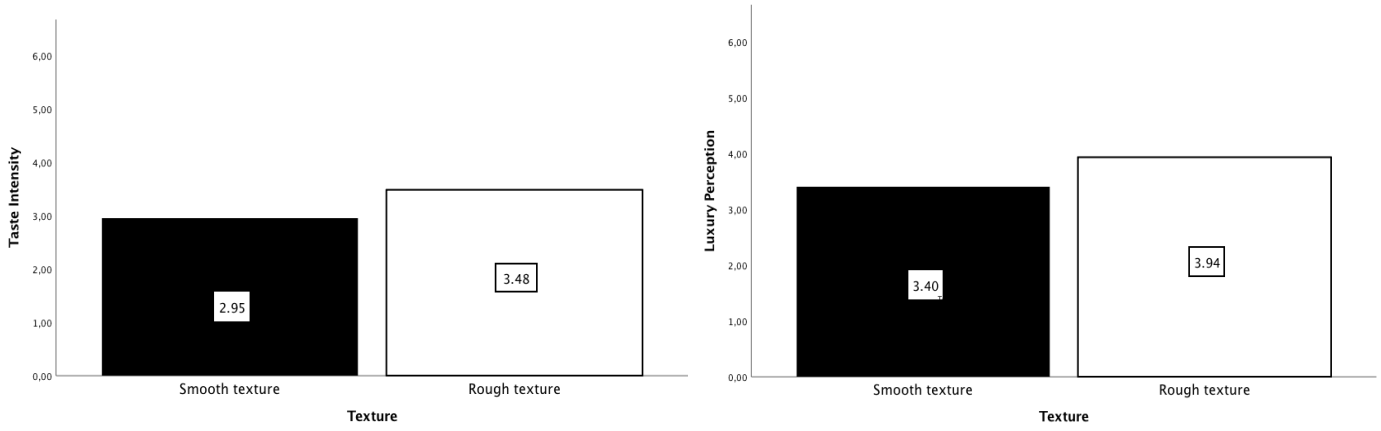

Figure 5. Texture on Taste Intensity (left) and Texture on Luxury Perception (right).

5.4.4 Weight effects

In addition, the effect of the packaging weight on the dependent variables was examined. The results showed a significant main effect of weight $F(1, 151) = 11.89, p < 0.01$. The analysis shows no significant main effect on taste liking, willingness to pay and purchase intention. However, a significant main effect was found for the dependent variables taste intensity $F(1, 151) = 53.39, p < 0.01$ and luxury perception $F(1, 151) = 4.83, p < 0.05$ ($p = .03$). Where, concerning taste intensity, the mean of the heavy weight condition ($M = 3.75, SD = 1.14$) is larger than the mean of the light weight condition ($M = 2.67, SD = .88$). In the case of luxury perception, the mean of heavy weight condition ($M = 3.91, SD = 1.45$) is larger than the mean of the light weight condition ($M = 3.42, SD = 1.41$). Thus, the weight of a package has an influence on taste intensity and luxury perception, where the participants perceived the taste as more intense and viewed the product as more luxurious in the heavy weight condition.

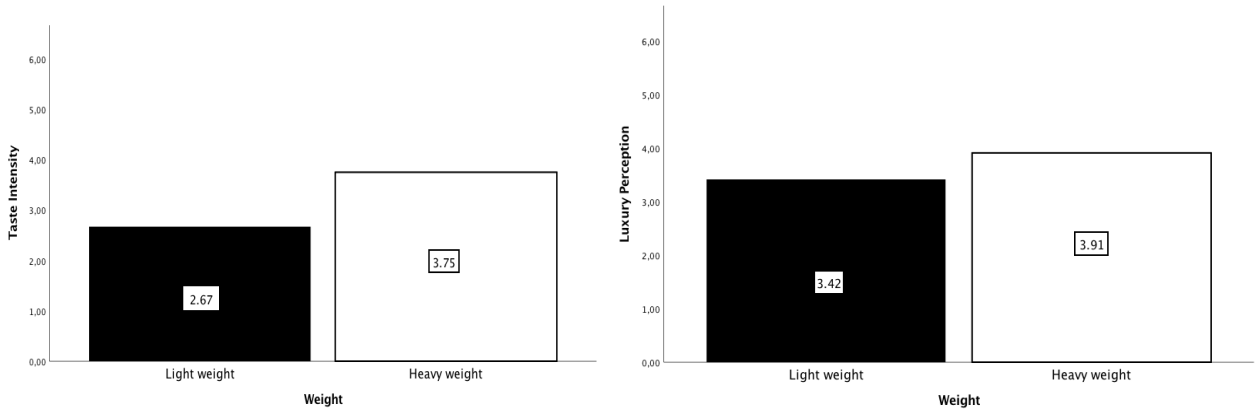

Figure 6. Weight on Taste Intensity (left) and Weight on Luxury Perception (right).

5.4.5 Interaction effects

Beside the main effects of shape, texture and weight, a multivariate analysis of variance was conducted to explore the possible interaction effects of the three independent variables on taste intensity, taste liking, luxury perception, the willingness to pay and purchase intention.

Shape x texture

Results showed that there is a significant interaction effect present $F(1, 151) = 2.91$, $p < 0.01$. Further investigation shows no significant interaction effect between shape and texture on taste liking, luxury perception, willingness to pay and purchase intention. Nevertheless, a significant interaction effect was found for taste intensity $F(1, 151) = 8.43$, $p < 0.01$. Thus, this result indicates that the interaction between the product shape and packaging texture results in a more intense taste. Figure 7 shows that on average, a rough texture resulted in a more intense taste than a smooth texture, regardless of the shape condition. However, the difference between the two textures seems to be much greater within the symmetrical shape condition than within the asymmetrical condition.

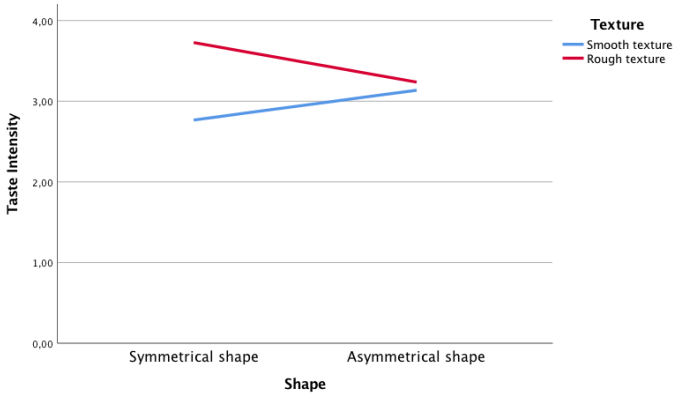

Figure 7. Shape x Texture on Taste Intensity

A follow-up test is needed to investigate the exact nature if this interaction, this is done by a simple effects test. Results showed that the difference between the rough and smooth texture within the symmetrical shape condition, is statistically significant $F(1, 156) = 14.901, p = < 0.01$. Participants who touched a rough package ($M = 3.78, SD = .18$) as opposed to participants who touched a smooth package ($M = 2.77, SD = .17$) perceived a more intense taste. Within the asymmetrical shape condition, no significant difference between the rough and smooth texture were found. Hence, the effect of packaging texture is more pronounced for a symmetrical shaped piece of chocolate than for an asymmetrical shaped piece of chocolate.

Shape x weight

The multivariate analysis of variance revealed a significant interaction effect $F(1, 151) = 2.97, p < 0.05$ ($p = .01$). There was no significant interaction effect between shape and weight on taste liking, luxury perception, willingness to pay and purchase intention. However, the results showed a significant interaction effect on taste intensity $F(1, 151) = 5.80, p < 0.05$ ($p = .02$). Thus, this indicated that the interaction between the shape of a product and the weight of a package result in a higher perceived taste intensity. Figure 8 shows that, on average, a heavy weight results in a more intense taste than a light weight, regardless of the shape condition. With a mean score of 3.58 for the heavy weight against a mean score of 2.88 for the light weight.

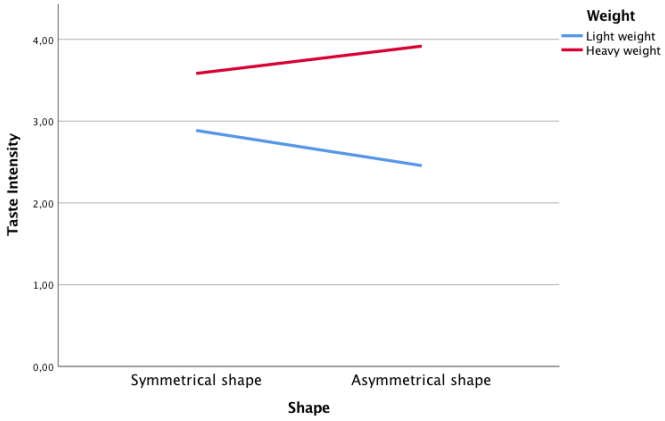

Figure 8. Shape x Weight on Taste Intensity

A simple effects test showed that the difference within the symmetrical condition is statistically significant $F(1, 156) = 9.55, p < 0.01$. Meaning that the participants, within the symmetrical shape condition, who touched a heavy weight ($M = 3.58, SD = .16$), evaluated the taste as more intense than the participants who touched a light weight ($M = 2.89, SD = .16$). Furthermore, the difference in weight within the asymmetrical shape condition is also found to be significant $F(1, 156) = 41.93, p < 0.01$. Within this shape condition, the participants who lifted a heavy weight ($M = 3.92, SD = .16$) evaluated the taste as more intense than the participants who lifted a light weight package ($M = 2.46, SD = .16$). To conclude, for both the shape conditions, an interaction with a heavy weight resulted in a higher evaluated taste intensity. However, the weight of a packaging design is more pronounced for a asymmetrical shaped piece of chocolate than for a symmetrical shaped piece of chocolate.

Texture x weight

The analysis showed no significant interaction effect $F(1, 151) = 1.36, p = .24$ between texture and weight of a package. Accordingly, this indicates that the texture and the weight of a package do not interact with each other and there is no combined effect on any of the dependent variables.

Shape x texture x weight

No significant interaction effect $F(1, 151) = .42, p = .83$ was found between the shape of the product and the texture and weight of the package. Meaning, there is no interaction between the three independent variables and the variables do not strengthen, nor reduce each other's effect.

5.5 Step 2 of the study

The following parts of this results section contains step two of study. First, the results of the manipulation check for congruency can be found. Subsequently, the effects of the eight different conditions, including their congruence or incongruence, on taste intensity, taste liking, luxury perception, willingness to pay and purchase intention is clarified. An overview of the results of the multivariate analysis of variance can be found in Appendix 3.

5.5.1 Manipulation Check

At first, a manipulation check was carried out prior to conducting the main analysis. This manipulation check verifies if the experimental manipulation has worked and has been understood by the participants. As described in the method section, the concept of congruency can be divided into three levels to simplify the results and interpretation, namely 'extreme congruence', 'congruence on touch' and 'incongruence'. A one-way analysis of variance, also shows a significant difference $F(2, 157) = 10.13$, $p < 0.01$ between extreme congruence ($M = 5.03$, $SD = 1.57$), congruence on touch ($M = 3.91$, $SD = 1.58$) and incongruence ($M = 3.65$, $SD = 1.63$).

5.5.2 Extreme congruence

To investigate whether the extreme congruence condition has an effect on taste intensity, taste liking, luxury perception, willingness to pay and purchase intention, a multivariate analysis of variance was conducted. At first, the results showed no significant effect of this condition $F(5, 152) = .85$, $p = .52$. No significant effect was found for the variables taste intensity, taste liking, willingness to pay and purchase intention. However, further investigation showed a marginally significant effect in the extreme congruence condition on the perception of luxury $F(1, 156) = 3.13$, $p < 0.1$ ($p = .08$). Where the mean score of the extreme congruent condition ($M = 4.00$, $SD = 1.74$) is higher than the mean score of the congruent on touch condition ($M = 3.31$, $SD = 1.25$) and the incongruent condition ($M = 3.68$, $SD = 1.35$).

These results suggest that when a package design consists of different attributes that are considered as congruent, the perception of luxury is evaluated higher compared to packaging designs that are considered as incongruent. This result is in line with previous research and the established hypothesis, claiming that the presence of congruency results in a more positive evaluation of a product.

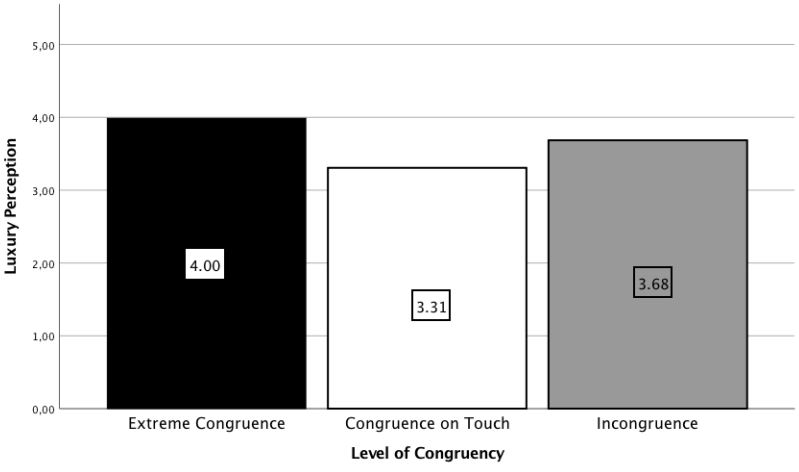

Figure 9. Congruency level on luxury perception

5.5.3 Congruence on touch

The multivariate analysis of variance showed no significant effect $F(5, 152) = .52, p = .76$ in the congruence on touch condition. Meaning, congruency between the tactile attributes of the product packaging (i.e. texture and weight) has no effect on taste intensity, taste liking, luxury perception, willingness to pay and purchase intention.

5.5.4 Incongruence

No significant effect was found for the incongruent packaging designs on the dependent variables $F(5, 152) = .76, p = .58$. These results indicate that an incongruent packaging design does not result in a higher perceived taste intensity, taste liking, luxury perception, willingness to pay and purchase intention. Although, no significant effect seems to be something negative, in this case it lies in line with the literature and established hypotheses. It was expected that an incongruent condition as opposed to a congruent condition would not result in a higher evaluation of the product.

5.4 Overview of the hypotheses

Considering the results of the study, the established hypotheses can either be supported or rejected. An overview of all the hypotheses is presented in table 6.

Table 6 – Overview of the hypotheses

Hypotheses		**Supported**
H1a	Congruency between the shape, texture and weight of a package design positively influences the *taste intensity* of the product.	No
H1b	Congruency between the shape, texture and weight of a package design positively influences the *taste liking* of the product.	No
H1c	Congruency between the shape, texture and weight of a package design positively influences the *luxury perception* of the product.	Yes*
H1d	Congruency between the shape, texture and weight of a package design positively influences the *willingness to pay* for the product.	No
H1e	Congruency between the shape, texture and weight of a package design positively influences the *purchase intention* of the product.	No
H2a	A symmetrical product shape, as opposed to an asymmetrical product shape, positively influences the *taste intensity* of the product.	No
H2b	A symmetrical product shape, as opposed to an asymmetrical product shape, positively influences the *taste liking* of the product.	No
H2c	A symmetrical product shape, as opposed to an asymmetrical product shape, positively influences the *luxury perception* of the product.	No
H2d	A symmetrical product shape, as opposed to an asymmetrical product shape, positively influences the *willingness to pay* for the product.	No
H2e	A symmetrical product shape, as opposed to an asymmetrical product shape, positively influences *the purchase intention* of the product.	No
H3a	A rough texture, as opposed to a smooth texture, positively influences the *taste intensity* of the product.	Yes
H3b	A rough texture, as opposed to a smooth texture, positively influences the *taste liking* of the product.	No
H3c	A rough texture, as opposed to a smooth texture, positively influences the *luxury perception* of the product.	Yes
H3d	A rough texture, as opposed to a smooth texture, positively influences *willingness to pay* for the product.	No
H3e	A rough texture, as opposed to a smooth texture, positively influences the *purchase intention* of the product.	No
H4a	A heavier package, as opposed to a lighter package, positively influences the *taste intensity* of the product.	Yes
H4b	A heavier package, as opposed to a lighter package, positively influences the *taste liking* of the product.	No

H4c	A heavier package, as opposed to a lighter package, positively influences the *luxury perception* of the product.	Yes
H4d	A heavier package, as opposed to a lighter package, positively influences the *willingness to pay* for the product.	No
H4e	A heavier package, as opposed to a lighter package, positively influences the *purchase intention* of the product.	No
H5a	The constructs *taste intensity, taste liking, luxury perception* and *willingness to pay* together will mediate the effects of the shape, texture and weight and positively influence purchase intention	Yes
H5b	The construct *taste intensity*, will mediate the effects of shape, texture and weight and positively influence purchase intention	No
H5c	The construct *taste liking*, will mediate the effects of shape, texture and weight and positively influence purchase intention	Yes
H5d	The construct *luxury perception*, will mediate the effects of shape, texture and weight and positively influence purchase intention	Yes
H5e	The construct *willingness to pay*, will mediate the effects of shape, texture and weight and positively influence purchase intention	Yes

* Supported with an alpha level of .10

6. Discussion

The aim of this study was to gain more insights in the effects of packaging attributes in the evaluation of food products. This research focused on the effects of product shape, packaging texture, packaging weight and their interaction. Eight different conditions were created, tested and analyzed in order to explore the effects on taste intensity, taste liking, luxury perception, willingness to pay and purchase intention. In this discussion section, the results are evaluated and final conclusions are given. Additionally, theoretical and practical implications along with the limitations of the study are discussed. Finally, a general conclusion is given.

6.1 Discussion of the results

6.1.1 Interaction and congruency effects

In line with the expectations, this study found several interaction and congruency effects. First, an interaction effect of product shape and packaging texture on *taste intensity* was found. Despite the condition of the shape, a rough texture resulted in higher evaluated taste intensity. Nevertheless, the effect of packaging texture is more pronounced within the symmetrical shape condition, than within the asymmetrical shape condition. This effect can be explained by the fact that a rough packing texture positively influences taste intensity, as already explained in this study. However, it is interesting to mention that although an interaction effect was expected, this combination of a symmetrical shape and rough texture was not expected. In line with the theory in this study, those manipulations are not congruent and neither do they communicate the same message. A possible explanation can be that the tactile information (i.e. texture) was better processed and therefore of greater influence than the visual information (i.e. shape). Whitaker, Simões-Franklin & Newell (2008) explained that texture perception is rarely encountered by touch alone. Before people make inferences about a texture, they use different sensory modalities which create a more accurate evaluation.

Furthermore, results showed an interaction effect of product shape and packaging weight on *taste intensity*. The present study showed that interaction between shape and weight indicates higher taste intensity. In general, a heavier weight results in a higher evaluation of taste intensity in contrast to a lighter weight. However, within the asymmetrical shape condition, this effect was the most obvious. This effect can best be explained by the fact that a heavy weight and asymmetrical shape can be seen as congruent. Although the level of symmetry is connected to the fluency hypothesis in this study and an asymmetric shape means a less intense taste, it can also be connected to angularity, which results in the opposite effect. Studies about angularity state that a more angular shape is connected to strong and intense tastes (Zhang et al., 2006). Moreover, heaviness is found to be an effective tool in communicating a dense, satiating and intense taste (Piqueras-Fiszman et al., 2011; Kampfer et al., 2017). This could explain why the interaction between a heavy weight and asymmetrical shape lead to a more intense taste.

Interestingly, for both interaction effects, the rough texture and heavy weight seems the best indicator for taste intensity, as expected. However, in the case of texture, the effect is more pronounced within the symmetrical condition. In the case of weight, within the asymmetrical condition. This could be explained by the fact that the influence of the product shape is smaller than the influence of the packaging attributes (i.e. texture and weight). In both cases, the mean score of the shape condition is significantly lower, than the mean score for texture or weight. Furthermore, in line with the processing fluency theory and the literature about textures, a rough texture and symmetrical condition both communicate an intense taste. Hence, the outcome of the first interaction effects seems logical based on the described literature. However, for the second interaction effect, the highest evaluated taste intensity lies within the asymmetrical condition and a heavy weight. In contradiction to the processing fluency theory, the effect of shape could be connected to studies about angularity. Claiming that more angular shapes, communicate an intense taste (Becker et al., 2011).

The interaction effects are an indicator for the second step of the study, the congruency effects. Although no significant main effects were found for the extreme congruence condition, a marginally significant effect was found on *luxury perception*. These results suggest that when a package design is congruent, the perception of luxury will be evaluated higher compared to a package

design that is partly congruent or incongruent. These findings are in line with previous research and the hypothesis claiming that the presence of congruency results in a more positive product evaluation. In addition, in line with the described processing fluency theory, the participants were willing to pay a higher price for the congruent product as opposed to the incongruent product.

However, no other interaction or congruency effects were found in the present study. It could be argued that the lack of findings relate to the manipulations used in this study. The different attributes that determine the level of congruency, are not all incorporated on the packaging itself. The texture and weight of the package are manipulated, but for the shape manipulation, the product itself was changed. Another explanation might be offered by the theories proposing that not congruence, but incongruence can provide positive effects. Incongruence can draw the attention of consumers by presenting something unexpected and therefore can be used as a strategy to elicit surprise (Schoormans & Robben, 1997; Ludden, Schifferstein & Hekkert, 2008).

6.1.2 Communicating taste intensity and luxury perception through texture and weight

The present study support earlier findings showing that a product packaging with a rough texture positively influences *taste intensity* and *luxury perception*. A rough texture as opposed to a smooth texture is a better tool in communicating an intense taste and a luxurious product. These results are in line with previous research claiming that a rough texture positively influences taste intensity (Becker et al., 2011; Piqueras-Fiszman & Spence, 2011). Also, earlier discoveries showed that rough packaging design is associated with a more luxurious product (Berends, 2016) and that product and taste evaluation is for a great deal based on tactile experience (Schifferstein, 2009).

Furthermore, beside packaging texture, packaging weight is a widely studies concept and known to influence consumer product experience (Piqueras-Fiszman & Spence, 2012). The present study confirms this evidence and reveals that weight indeed has an influence on taste and product evaluation. The results show that a heavier package (i.e. an extra weight of 100 grams added to an original bar of chocolate of 100 grams) positively influenced the *taste intensity* and *luxury perception*. Meaning, that when confronted with a heavier weighted package, the taste was evaluated as more intense and the product as more luxurious. Comparable results were found in studies of Piqueras-Fiszman et al. (2011) and Kampfer et al. (2017), both demonstrated that weight is positively associated with perceptions of taste intensity. The heavier the container or packaging, the more intense the flavour was perceived. Furthermore, a heavier package is commonly rated as a product of better quality and higher expenses (Lindstrom, 2005; Piqueras-Fiszman & Spence, 2012), which is in line with the findings of the present study concerning the measured variable luxury perception.

Even though there is a substantial amount of evidence demonstrating several effects of packaging texture and weight, no significant effects were found for taste liking, willingness to pay and purchase intention. Focusing on texture, although the participants did evaluate the product of a rough textured package as more intense and luxurious, this did not result in a higher taste liking. This could be explained by assumption that a rough texture mostly communicates strong, intense and more bitter tastes. Where for some food products a strong or bitter taste is perceived as something positive, in the case of chocolate it can also be a negative indicator for taste liking. The craving and liking for chocolate is mostly based on the liking for sweets (Rozin, Levine & Stoess, 1991) and people are more likely to want more chocolate when it has a high sugar content (Nasser et al., 2011). Interestingly, although the perception of luxury was higher in the rough texture condition, no significant effect was found for the willingness to pay or purchase intention. This is contrary to the findings that when a product has a certain feel or texture, it encourages consumers to pick up and touch the product, which subsequently can lead to feelings of psychological ownership and a higher willingness to buy (Peck & Shu, 2009; Peck, 2010; Gallace & Spence, 2014). A possible explanation can be the fact that taste liking plays a dual role in the purchase decision. This also can be explained by the conducted regression analysis that showed that the variable taste liking had the strongest unique contribution in the prediction of purchase intention. In this case, the fact that participants could taste the product and their evaluation of taste liking could have been of more importance than the visual and tactile experience of the product.

Looking at the effects of packaging weight, also some hypothesized effects were not found. Even though the participants rated the chocolate in a heavier package as more luxurious and earlier research shows a strong correlation between heaviness, quality and the willingness to pay, no

significant effect was found for the willingness to pay and purchase intention (Spence, 2016). Most likely, other factors are of greater influence in the decision-making process than the perception of luxury. For instance, the taste liking of the contents. Also no significant main effect was found of heaviness on taste liking. The originally formulated hypothesis about the influence of weight on taste liking was based on the theory behind the concept of sensation transference. The lack of direct evidence supporting this hypothesis is a possible explanation for the fact that no effects were found during the present study.

To conclude, when one wants to communicate an intense taste and the perception of luxury, adding a rough texture and extra weight to a packaging design can be helpful.

6.1.3 Marginal effect of shape on taste liking

This study investigated the effects of two different product shapes on taste and product evaluation. Previous research highlighted the importance of the visual appearance of a product (Juravle et al., 2015) and in the last couple of years an increasing amount of research focused on matching shapes to tastes (Ngo, Misra & Spence, 2011; Spence & Deroy, 2014; Velasco et al., 2015, 2016). However, these studies mostly aimed attention on shape curvature and contour, where this study focused on the effects of a symmetrical shape versus an asymmetrical shape. The influence of the symmetry of shape can be explained by the fluency hypothesis (Reber & Schwarz, 1999). Following these findings, a high level of symmetry in a shape would result in a higher perceived taste intensity, taste liking, luxury perception, willingness to pay and ultimately purchase intention. However, this study did not confirm these previous findings. Manipulating the shape in this study resulted in a higher evaluated *taste liking* in the asymmetrical shape condition. Meaning, chocolate presented in asymmetrical chunks resulted in a higher evaluated taste liking, than symmetrical pieces of chocolate. However, the effect was only significant for an alpha level of .10 with a p-value of .09. No other significant effects for the influence of shape were found.

A possible explanation lies in the fact that instead of explaining the influence of symmetrical and asymmetrical shapes with the processing fluency theory, the influence of shape should be linked to theories about angularity. It can be argued that the asymmetrical chunks used in this study are similar to angular shapes used in previous studies and therefore, the existing theories about angularity would be a better fit to the present study than the processing fluency theory. For example, Becker et al. (2011) showed that a more angular shape lead to a stronger and more intense taste. Studies of Zhang et al. (2006) and Ngo et al. (2011) showed the same results; both studies connected more angular shapes to sharper, stronger and more bitter and intense tastes than rounder shapes. Linking to these results would change the initially formulated hypotheses of this study. Instead of hypothesizing that a symmetrical shape positively influences the taste intensity and taste liking, it could be hypothesized that the asymmetrical shape leads to a more intense taste and a higher evaluated taste liking. In that case, the present study confirms earlier discoveries and supports the fact that more angular and asymmetrical shapes lead to a higher taste liking.

Furthermore, the fact that a more asymmetrical chunk of chocolate led to a higher perceived taste liking as opposed to a neat symmetrical piece, can be the result of the ‘naturalness’ of the shape. It is widely demonstrated that several packaging cues can lead to higher expected food naturalness, which subsequently, can lead to a higher perceived freshness, a better quality and even a tastier product (Brown, 1958; Krishna & Morrin, 2008; Werle, Trendel & Ardito, 2013). Although, there are no direct effects of the level of symmetry of shape on perceived naturalness discovered until now, it is possible that the asymmetric chunks are considered as more natural and the neat symmetric pieces as more artificial. This more natural shape compared to an artificial shape can lead to a more natural and better taste, due to crossmodal correspondence. Nevertheless, this assumption requires further research before it can be used as an underlying theory.

Moreover, earlier studies mostly manipulated the shape of a product packaging or container, this experiment manipulated the shape of the actual product. Additionally, the shape of the product packaging was not intentional manipulated in the experiment, but it is likely to assume that, consciously or unconsciously, this shape was of influence in the evaluation of the product and its taste. Therefore, the effect of shape in this study is possibly not only based on the manipulated product shape, but also on the shape of the packaging that was used in the experiment.

6.1.6 Indicators for purchase intention

The dependent variables, taste intensity, taste liking, luxury perception and willingness to pay together have a predictive power of more than 60% on the construct of *purchase intention*. Meaning, that based on the influence of the different constructs, a prediction can be made about the consumers' purchase intention. Except for taste intensity, a significant unique contribution in the prediction of purchase intention was found for all the constructs. Especially taste liking showed the strongest unique contribution in this prediction. Therefore, it seems that the actual taste of a product influences whether a consumer wants to buy a product. However, in a 'normal' shopping situation in a supermarket or an online shopping environment, consumers do not have the chance to taste a product beforehand. They only can relate on previous purchases, similar products or the packaging design.

Interestingly, the perception of luxury and the willingness to pay for a product seem to be more logical predictors of purchase intention. When a product is perceived as more luxurious the willingness to pay a higher price for the product most likely increases. It seems logical that if a consumer is willing to pay for a product, he or she will also have a higher intention of actually buying the product. However, the unique contribution of luxury perception and willingness to pay scored lower than the contribution of taste liking. Thus, it can be concluded that when consumers have the opportunity to taste a product beforehand, this will influence their purchase intention. Even though consumers may perceive a product as luxurious and are willing to pay a higher price, when they do not like the actual taste of the product, their intention to purchase that product will decrease.

6.2 Implications

6.2.1 Practical implications

Earlier research on the influence of product packaging demonstrated that when shopping for food and beverages, almost 73% of the purchase decisions are made at the point of sale and one of the major factors influencing this decision is the appearance of the product on the shelf (Rettie & Brewer, 2000; Grunert, 2016). Packaging design, and especially in a multisensory way, can add value to this appearance and influence the consumers' judgments of the content and set product expectations (Spence, 2016). With the increased competition in retail and all the products and brands that are offered in stores nowadays, it is of great importance for food manufactures and marketers to gain insight in the effects of product packaging and its influence on consumer responses. This study shows that the use of shape, texture and weight can have an influence in product evaluation. Especially the effects of heaviness and a rough texture are already widely studied, and once again found effective in communicating an intense taste and feelings of luxury. Furthermore, the interaction between shape and texture and the interaction between shape and weight are found to be an effective tool in communicating the taste intensity of a product. Finally, consumers are willing to pay a higher price for products that are congruent as opposed to products that are incongruent. Especially this effect can be of great importance for marketers that are responsible for branding a food product.

6.2.2 Theoretical implications

Looking into the theoretical contribution of this study, this research supports some previous findings about the influence of packaging design on product evaluation and consumer responses. Particularly, the influence and effects of packaging texture and packaging weight are in line with previous research. The results of the present study make this existing evidence more valid and valuable. Also, in line with the processing fluency theory, the findings of the present study partly support the evidence that congruence as opposed to incongruence leads to positive consumer responses. The results show that consumers are willing to pay a higher price for congruent products and a marginally statistical effect was found for congruence on the perception of luxury.

Additionally, this research provides new results and data about the influence of symmetrical versus asymmetrical shapes of a product. Especially the interaction between product shape and packaging texture and the interaction between product shape and packaging weight. This study has found some convincing evidence that these interactions result in a higher evaluated taste intensity. Since there is no previous research addressing and manipulating product shape in the way of the

present study, these findings really contribute to the current knowledge about the influence of product shape and packaging designs on taste evaluation. Although not al established hypothesis could be supported, this study is a great base for future research into the concept of congruency and product shape. Two concepts that can be, and need to be, elaborated more in the future so they can be of value for practical implications.

6.3 Limitations and recommendations

The present study provides interesting new findings and results that support earlier research. However, there are some limitations worth noting. First, although the experiment took place in a supermarket and the setting was made as realistic as possible, the setting was still somewhat experimental. The fact that the participants had to sit down at a table with the manipulation in front of them caused some limitations. Especially the fact that purchase intention was measured, but the participants could not actually buy the product. They just had to imagine if they would in another situation. This could explain why no significant effects were found for this variable. Future research could focus on an even more realistic shopping environment to draw better conclusions about the effects of packaging design on purchase intention.

Additionally, in the experiment, the taste sample, packaging design and the questionnaire were already laid down on a table. Most participants immediately consumed the taste sample before observing the packaging design or starting the questionnaire, even though instructions were given beforehand. The fact that vision, touch and taste all were assessed separately, and sometimes in different orders, could be of influence for the data and results. To avoid these limitations, taking more control over the experiment could be helpful. For instance by handing out the manipulations and questionnaire in the desired order and give more clear instructions.

Considering the stimulus material used in the experiment, it is important to mention that although the stimulus material was as realistic as possible, it was a handmade product, which can cause slight differences across the conditions. Therefore, it is advised to create more authentic and real packages in future research, for instance with a 3D-pinter.

Moreover, an online questionnaire was used for fast data collection and easy processing. Nevertheless, this questionnaire did not gain insights in the unconscious processes caused by the conditions and manipulations. Especially within this field of research, this unconscious process could provide some very valuable data. This is something to consider in future research or could be investigated as an addition to the present study.

Taking the limitations in consideration, additional recommendations and guidelines for future research can be formulated. First of all it would be interesting to explore if the same results and conclusions holds for different types of food products, or even in complete other product categories. The present study investigated chocolate, a more hedonic food product, but it would be interesting to see if this would work for utilitarian products as well. Also within the food category chocolate, more research is possible. This study used a basic milk chocolate, but it could be interesting to see if the same principles hold for other chocolate flavours, or if different flavours need different packaging and communication tools. Moreover, future research could elaborate on the present study by changing or adjusting the variables. For instance, instead of manipulating the product shape, it could be interesting to manipulate the packaging itself in a symmetrical versus an asymmetrical shape. Also, beside the shape, texture and weight, other, or more, combinations of packaging attributes can be investigated in future research. Furthermore, moderating variables could be added in the design, to expand the research. The present study took taste and chocolate preferences in consideration, but these results were not reported since they did not cause remarkable differences. In future research, taste preferences could be investigated further. Additionally, other mediating or moderating variables can be explored, such as the consumers' buying behavior, appreciation for design or the shopping environment. In the meantime, the results of the present study form a good foundation for future research and already provide some findings for practical implication.

6.4 Conclusion

The goal of this study was to investigate to what extent product shape, packaging texture and packaging weight influence taste and product evaluation. Additionally, the presence and effect of congruency between the independent variables was measured and explored. This study shows that the use of shape, texture and weight can have an influence in taste and product evaluation. Especially effects of heaviness and a rough texture are found to be effective in communicating an intense taste and a luxurious feeling. Furthermore, the interaction between shape and texture and the interaction between shape and weight are found to be an effective tool in communicating the taste intensity of a product. Finally, consumers are willing to pay a higher price for products that are congruent as opposed to products that are incongruent. Especially this effect can be of great importance for marketers and food manufactures. Although, not all effects were found to be significant, the outcomes did contribute to the current knowledge about packaging design and its influence on taste and product evaluation. The present study aimed at answering the research question: "*To what extent do multisensory packaging attributes (i.e. shape, texture and weight) influence taste intensity, taste liking, luxury perception, willingness to pay and purchase intention for the food product chocolate and how do these packaging attributes interact with each other?*". Through a 2 x 2 x 2 experimental design, this study succeeded in answering this question. Texture and weight do influence taste intensity and luxury perception and shape gives the suggestion to have an effect on taste liking. Furthermore, congruence between the three independent variables results in a higher willingness to pay and suggest an effect on luxury perception. Furthermore, taste intensity, taste liking, luxury perception and the willingness to pay are a good predictor of purchase intention. Especially taste liking seems to contribute the strongest to this variable. To conclude, this research is an addition to the research field of product packaging design and shows that manipulating shape, texture and weight can influence consumer responses in a positive way. Which ultimately leads to a foundation for practical implications for food manufactures and marketers.

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Appendix 1 - Pre-test

Beste respondent,

Bedankt dat u mee wilt werken aan dit onderzoek. Voor mijn Master Communicatiewetenschappen aan de Universiteit Twente doe ik onderzoek naar de invloed van product verpakkingen, deze vragenlijst is hier een onderdeel van. In deze korte vragenlijst worden afbeeldingen en verpakkingen getoond waar enkele vragen over gesteld worden. Probeer de vragen naar waarheid in te vullen, er is geen goed of fout.

Het onderzoek zal ongeveer 5 minuten van uw tijd in beslag nemen. Er wordt vertrouwelijk met uw gegevens omgegaan en de resultaten worden volledig anoniem verwerkt.

Mocht u vragen of opmerkingen hebben, neem dan contact op via n.j.m.m.schutrups@student.utwente.nl.

Q1 Wat is uw geslacht?

- ○ Man
- ○ Vrouw

Q2 Wat is uw leeftijd?

_____

Q3

In hoeverre vindt u dat de volgende begrippen passen bij de bovenstaande afbeelding?

	Zeer passend	2	3	4	5	6	Zeer onpassend
Symmetrisch	○	○	○	○	○	○	○
Evenredig	○	○	○	○	○	○	○
Ongebalanceerd	○	○	○	○	○	○	○
Assymetrisch	○	○	○	○	○	○	○
Gelijk	○	○	○	○	○	○	○
Oneven	○	○	○	○	○	○	○

Q4

In hoeverre vindt u dat de volgende begrippen passen bij de bovenstaande afbeelding?

	Zeer passend	2	3	4	5	6	Zeer onpassend
Symmetrisch	○	○	○	○	○	○	○
Evenredig	○	○	○	○	○	○	○
Ongebalanceerd	○	○	○	○	○	○	○
Assymetrisch	○	○	○	○	○	○	○
Gelijk	○	○	○	○	○	○	○
Oneven	○	○	○	○	○	○	○

Q5
Er wordt u nu een verpakking getoond. Bekijk de verpakking en houd deze vast.

In hoeverre vindt u dat de volgende begrippen passen bij de getoonde verpakking?

	Zeer passend	2	3	4	5	6	Zeer onpassend
Egaal	○	○	○	○	○	○	○
Ruw	○	○	○	○	○	○	○
Effen	○	○	○	○	○	○	○
Glad	○	○	○	○	○	○	○
Hobbelig	○	○	○	○	○	○	○
Grof	○	○	○	○	○	○	○

Q6
Er wordt u nu een verpakking getoond. Bekijk de verpakking en houd deze vast.

In hoeverre vindt u dat de volgende begrippen passen bij de getoonde verpakking?

	Zeer passend	2	3	4	5	6	Zeer onpassend
Licht	○	○	○	○	○	○	○
Massief	○	○	○	○	○	○	○
Makkelijk te tillen	○	○	○	○	○	○	○
Zwaar	○	○	○	○	○	○	○
Volumineus	○	○	○	○	○	○	○
Subtiel	○	○	○	○	○	○	○

Appendix 2 - Main study

Beste respondent,

Bedankt dat u mee wilt werken aan dit onderzoek. Op dit moment ben ik bezig met het afronden van mijn Master Communicatiewetenschappen aan de Universiteit Twente en deze vragenlijst is hier een onderdeel van. In dit onderzoek wordt nagegaan wat de consument vind van een nieuw merk chocola en daarbij de verpakking van deze chocola.

Tijdens dit onderzoek wordt u gevraagd om een chocolade verpakking te bekijken en chocola te proeven, vervolgens moet u een vragenlijst invullen. Probeer de vragen zoveel mogelijk naar uw eigen waarheid in te vullen, er is geen goed of fout antwoord.

Het onderzoek zal ongeveer 5 minuten van uw tijd in beslag nemen. Er wordt vertrouwelijk met uw gegevens omgegaan en de resultaten worden volledig anoniem verwerkt. U heeft altijd het recht zich terug te trekken en verdere deelname aan het onderzoek te staken.

Mocht u vragen of opmerkingen hebben, neem dan contact op via n.j.m.m.schutrups@student.utwente.nl.

Q1 Ik ga hierbij akkoord met deelname aan dit onderzoek

- ○ Ja

Q2 Wat is uw geslacht?

- ○ Man
- ○ Vrouw

Q3 Wat is uw leeftijd?

_____

Bekijk en voel de verpakking die voor u ligt, neem hier alle tijd voor die u nodig heeft. Ondertussen mag u genieten van het stukje chocola dat voor u klaar ligt. Zodra u er klaar voor bent mag u beginnen aan de vragenlijst hieronder.

Q4 Ik zou de smaak van de chocola die ik zojuist geproefd heb beschrijven als...

	Totaal niet mee eens 1	2	3	4	5	6	Totaal mee eens 7
Bitter	○	○	○	○	○	○	○
Scherp	○	○	○	○	○	○	○
Mild	○	○	○	○	○	○	○
Zoet	○	○	○	○	○	○	○
Sterk	○	○	○	○	○	○	○
Romig	○	○	○	○	○	○	○
Intens	○	○	○	○	○	○	○
Krachtig	○	○	○	○	○	○	○
Puur	○	○	○	○	○	○	○

Q5 Beantwoord de volgende stellingen over de chocola die u zojuist heeft gezien, gevoeld en geproefd naar eigen inzicht.

	Totaal niet mee eens 1	2	3	4	5	6	Totaal mee eens 7
Deze chocola heeft een goede smaak	○	○	○	○	○	○	○
Deze chocola is smaakvol	○	○	○	○	○	○	○
Deze chocola is prettig om te eten	○	○	○	○	○	○	○
Ik vind deze chocola lekker	○	○	○	○	○	○	○

Q6 Beantwoord de volgende stellingen over de chocola die u zojuist heeft gezien, gevoeld en geproefd naar eigen inzicht.

	Totaal niet mee eens 1	2	3	4	5	6	Totaal mee eens 7
Dit is een chique chocola	○	○	○	○	○	○	○
Dit is een alledaagse chocola	○	○	○	○	○	○	○
Dit is een doorsnee chocola	○	○	○	○	○	○	○
Dit is een exclusieve chocola	○	○	○	○	○	○	○
Ik zou deze chocola willen proberen	○	○	○	○	○	○	○
Wanneer ik chocola wil kopen, zal ik dit product overwegen	○	○	○	○	○	○	○
Ik zou deze chocola aanbevelen aan mijn vrienden	○	○	○	○	○	○	○

Q7 Een reep chocola kost gemiddeld €1,20 in een Nederlandse supermarkt. Wat denkt u dat de gemiddelde prijs is van de chocola die u zojuist heeft gezien, gevoeld en geproefd?

Noteer uw antwoord in Euro's.

_____

Q8 Wat zou u, op basis van wat u heeft gezien, gevoeld en geproefd voor deze chocola willen betalen in een Nederlandse supermarkt?

Noteer uw antwoord in Euro's.

_____

Q9 Beantwoord de volgende stellingen over de chocola die u zojuist heeft gezien en gevoeld naar eigen inzicht.

	Totaal niet mee eens 1	2	3	4	5	6	Totaal mee eens 7
De verpakking van de chocola is egaal	○	○	○	○	○	○	○
De verpakking van de chocola is licht van gewicht	○	○	○	○	○	○	○
Het stukje chocola dat ik heb geproefd had de vorm van een rechthoekig blokje	○	○	○	○	○	○	○

Q10 Beantwoord de volgende stellingen over de chocola die u zojuist heeft gezien en gevoeld naar eigen inzicht.

	Totaal niet mee eens 1	2	3	4	5	6	Totaal mee eens 7
De chocola en de verpakking vormen één geheel	○	○	○	○	○	○	○
De chocola en de verpakking hangen goed met elkaar samen	○	○	○	○	○	○	○
De inhoud past bij de verpakking	○	○	○	○	○	○	○

Q11 Beantwoord de volgende stellingen over uw persoonlijke voorkeuren.

	Totaal niet mee eens 1	2	3	4	5	6	Totaal mee eens 7
Ik houd van sterke smaken	○	○	○	○	○	○	○
Ik houd van intense smaken	○	○	○	○	○	○	○
Als ik chocola eet, is dit meestal melk chocola	○	○	○	○	○	○	○

Q12 Hoe vaak per week eet u chocola? Het gaat hier om een stuk of reep chocola, geen producten waar chocola in verwerkt is.

Wanneer u nooit chocola eet vul dan 0 in.

_____

Dit is het einde van deze vragenlijst. Ik wil u hartelijk bedanken voor uw tijd en medewerking aan dit onderzoek.

Mocht u nog vragen of opmerkingen hebben, neem dan contact op via n.j.m.m.schutrups@student.utwente.nl.

Appendix 3 – Additional tables

3.1 Outcomes of the pre-test

Appendix table 1 – Mean and standard deviations of shape

Shape	N	Mean	SD
Symmetrical	15	3.05	1.44
Asymmetrical	15	5.39	.70
Total	30	4.22	1.07

Appendix table 2 - Mean and standard deviations of texture

Texture	N	Mean	SD
Smooth	15	1.74	0.80
Rough	15	5.30	0.62
Total	30	3.42	0.71

Appendix table 3 - Mean and standard deviations of weight

Weight	N	Mean	SD
Light	15	2.26	0.91
Heavy	15	4.01	1.34
Total	30	3.09	2.25

3.2 Main study - Multiple regression analysis

Appendix table 4 – Multiple regression analysis of purchase intention

Model	Variable	B	BE	β	*t*	*P*	R^2
1							.64
	Taste Liking	.72	.06	.64	12.11	.00	
	Taste Intensity	.00	.06	.00	.05	.96	
	Luxury Perception	.14	.06	.14	2.25	.03	
	Willingness to Pay	.49	.17	.19	2.89	.00	

3.2 Main study – step 1

Appendix table 5 – Mean and standard deviations of level of congruence

Factor	Factor specification	Taste Intensity	Taste Liking	Luxury Perception	Purchase Intention	Willingness to Pay
Shape	Symmetrical	M: 3.25 SD: 1.16	M: 4.97 SD: 1.20	M: 3.68 SD: 1.41	M: 4.38 SD: 1.39	M: 1.44 SD: .50
	Asymmetrical	M: 3.19 SD: 1.16	M: 5.32 SD: 1.36	M: 3.65 SD: 1.49	M: 4.58 SD: 1.48	M: 1.50 SD: .61
Texture	Smooth	M: 2.95 SD: .93	M: 5.26 SD: 1.29	M: 3.40 SD: 1.43	M: 4.64 SD: 1.32	M: 1.41 SD: .45
	Rough	M: 3.48 SD: 1.30	M: 5.03 SD: 1.29	M: 3.94 SD: 1.43	M: 4.32 SD: 1.55	M: 1.54 SD: .65
Weight	Light	M: 2.67 SD: 1.30	M: 5.16 SD: 1.37	M: 3.42 SD: 1.41	M: 4.30 SD: 1.64	M: 1.40 SD: .62
	Heavy	M: 3.75 SD: 1.14	M: 5.13 SD: 1.22	M: 3.91 SD: 1.45	M: 4.66 SD: 1.20	M: 1.54 SD: .49

Appendix table 6 – MANOVA table shape, texture and weight

Factor	*F*	*P*	Dependent variable	*F*	*P*
Shape	.82	.54			
			Taste Intensity	.18	.67
			Taste Liking*	2.93	.09
			Luxury Perception	.02	.90
			Purchase Intention	.89	.35
			Willingness To Pay	.47	.49
Texture	5.06	.00			
			Taste Intensity	12.74	.00
			Taste Liking	1.33	.25
			Luxury Perception	5.70	.02
			Purchase Intention	1.97	.16
			Willingness To Pay	2.02	.16
Weight	11.89	.00			
			Taste Intensity	53.39	.00
			Taste Liking	.03	.87
			Luxury Perception	4.83	.03
			Purchase Intention	2.41	.12
			Willingness To Pay	2.53	.11

Shape x Texture	3.91	.00			
			Taste Intensity	8.43	.00
			Taste Liking	.27	.61
			Luxury Perception	2.95	.09
			Purchase Intention	3.55	.06
			Willingness To Pay	.36	.55
Shape x Weight	2.97	.01			
			Taste Intensity	5.80	.02
			Taste Liking	.01	.92
			Luxury Perception	2.14	.15
			Purchase Intention	.12	.74
			Willingness To Pay	1.39	.24
Texture x Weight	1.36	.24			
			Taste Intensity	3.14	.08
			Taste Liking	0.00	.95
			Luxury Perception	.10	.75
			Purchase Intention	.83	.36
			Willingness To Pay	.02	.89
Shape x Texture x Weight	.42	.83			
			Taste Intensity	1.22	.27
			Taste Liking	.11	.74
			Luxury Perception	.02	.90
			Purchase Intention	.02	.89
			Willingness To Pay	.45	.51

* Significant for an alpha level of .10

3.3 Main study – step 2

Appendix table 7 – Mean and standard deviations of level of congruence

Level of Congruence	Taste Intensity	Taste Liking	Luxury Perception	Purchase Intention	Willingness to Pay
Extreme congruence	M: 3.31	M: 5.18	M: 3.99	M: 4.76	M: 1.44
	SD: 1.37	SD: 1.39	SD: 1.74	SD: 1.49	SD: .60
Congruence on Touch	M: 3.42	M: 5.13	M: 3.31	M: 4.44	M: 1.50
	SD: 1.30	SD: 1.23	SD: 1.25	SD: 1.50	SD: .48
Incongruence	M: 3.06	M: 5.16	M: 3.68	M: 4.40	M: 1.47
	SD: .93	SD: 1.28	SD: 1.35	SD: 1.39	SD: .58

Appendix table 8 – MANOVA table level of congruence

Factor	*F*	*P*	Dependent variable	*F*	*P*
Extreme Congruence	.85	.52			
			Taste Intensity	.00	.99
			Taste Liking	.19	.66
			Luxury Perception*	3.13	.08
			Purchase Intention	.00	.95
			Willingness To Pay	.63	.43
Congruence on Touch	.52	.76			
			Taste Intensity	.01	.94
			Taste Liking	.23	.64
			Luxury Perception	1.57	.21
			Purchase Intention	.02	.88
			Willingness To Pay	.78	.38
Incongruence	.76	.58			
			Taste Intensity	.06	.81
			Taste Liking	.20	.65
			Luxury Perception	2.33	.13
			Purchase Intention	.03	.86
			Willingness To Pay	.70	.40

* Significant for an alpha level of .10