The (m)intensity of verticality

What is the effect of verticality and longitudinality in packaging on consumer responses?

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ABSTRACT

Objective/aim: In the field of verticality on consumer responses, research largely consist of studies that investigated the influence of single design features as verticality cues and vertical oriented images in packaging on consumer responses. The influence and congruence between verticality cues and longitudinality in packages is understudied. Therefore, this research aims to examine whether different combinations of verticality (vertical vs. horizontal cues) and longitudinality (longitudinal, lateral and neutral packaging) in packaging influences consumer responses, like taste experience, perceived attractiveness and purchase intention. This leads to the following research question: What is the effect of verticality and longitudinality in packaging on consumer responses?

Method: A taste experiment with questionnaire was set out to measure the relationship between the two dependent variables (verticality and longitudinality) and three dependent variables (taste experience, perceived attractiveness and purchase intention) in a 2 x 3 design. In total 185 Dutch participants participated in this study.

Findings: Results from this study showed no significant effect of verticality cues and longitudinality on consumer responses. However, results showed that taste experience and perceived attractiveness have a strong contribution on purchase intention. On this basis, it can be concluded that verticality cues in combination with longitudinality in packaging have no effect on consumer responses for products with an intense taste.

Practical implications: It is interesting for companies and marketers to invest in designing attractive packages, because this will positively influence the purchase intention of consumers. Furthermore, it might be interesting for companies to further investigate the effects of verticality in packaging for less intense taste products.

Keywords: Verticality cues, packaging, longitudinality, taste experience, perceived attractiveness, purchase intention.

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1. INTRODUCTION

Nowadays, consumers have a number of choices while shopping for their everyday food and beverages. Almost every product is available from multiple types of brands. What triggers us to choose one brand over another? What does packaging tell us when we are standing in front of a product shelf? This study elaborates the effect of verticality and longitudinality in packaging on consumer responses.

With a plethora of brands in the marketplace, marketers use many different ways to engage customers with their brand (Cian, Krishna & Elder, 2014). Particularly, packaging received the attention of organizations, because it is the main tool of sales promotion for their product (Amin, Imran, Abbas & Rauf, 2015). Without any 'spoken sales-man', the brand can talk to consumers through the design of the package. Packaging will affect consumers response and purchase intentions, because it allows consumers to form expectations about the product, its attributes and its taste (Ares & Deliza, 2010; Becker, van Rompay, Schifferstein & Galetzka, 2010). As suggested above, the effect of a packaging is extremely important and can be influenced by its aesthetics. This study focusses on 'Verticality', a very new concept in aesthetics in packages.

The theory behind verticality has been used in metaphorical association for a long time. Examples of such metaphors are cases of 'control is *up*' and 'lack of control is *down*', which means: high power equals up. In other words, these metaphors describe power in a vertically related dimension (Schubert, 2005; Machiels & Ort, 2017). However, it has been found that the theory behind 'verticality', in addition to textual metaphor, also can be applied visually in packaging design.

Previous research on verticality in packaging on consumer behavior showed that upward movement is perceived as being more powerful and luxurious instead of horizontal movement (van Rompay, Fransen, & Borgelink, 2014). Another study in the field of verticality tested 2 ad-displays with vertical and horizontal visual cues. Results showed that participants gave higher ratings on taste intensity and luxury perception when they were exposed to an ad-display with vertically oriented visual cues, as opposed to horizontally oriented visual cues (van Rompay, van Hoof, Rorink and Folsche, 2019). However, the impact of longitudinality for these cues is not take into account. Longitudinality occurs through the form of the package. For example, vertical stripes on a standing rectangular package form have longer stripes, which means that the cues are longitudinal, as opposed to lateral. Assuming that longer is stronger, longitudinal designs might positively effect consumer responses. However, as far as the author knows, this effect has never been tested before.

Since verticality is a new idea in designs and longitudinality has never been tested within vertical cues, there used to be a gap in our knowledge concerning the effect of verticality and longitudinality in packaging on consumer response. The goal of this study is to fill this gap by examining whether

verticality (horizontal vs. vertical designs) and longitudinality (longitudinal vs. lateral vs. neutral) in packaging influences consumer responses (taste evaluation, perceived attractiveness and purchase intention). To examine the effects of verticality and longitudinality, an experimental 2x3 design, with the use of a taste test and questionnaire were applied in order to answer the following research question: *What is the effect of verticality and longitudinality in packaging on consumer responses?*

In this paper, first a literature review is presented to introduce the reader to all relevant literature concerning the effects of verticality and longitudinality in packaging on consumer responses. Subsequently, the methodology of this study is described. Thereafter, the main results of this study gathered from the questionnaire will be presented. Finally, results, limitations and implications for further research are discussed.

Definition box:

Longitudinality:	In the direction of the length (of the package)
Laterality:	In the direction of the width (of the package)

2. THEORETICAL FRAMEWORK

This chapter evaluates previous literature that is related to the independent (verticality and longitudinality) and the dependent variables (taste experience, attractiveness of package and purchase intention) for fast-moving consumer. This will lead to a conceptualization of all the hypotheses of this study.

2.1 Impact of packaging for fast-moving consumer goods

In a world where many similar products are competing to gain consumer interest and must perform in a wide variety of retail venues, packaging is becoming increasingly important. Companies are looking for unique packaging, because not only does this capture awareness but packages also serves as a means of communicating with consumers. Packages frequently are the first exposure consumers have to products (Cian, Krishna & Elder, 2014). This first exposure can lead to several consumer responses, for example price expectations, taste expectations or purchase intention. Specifically, for fast-moving consumer goods (e.g. daily purchased products) the first exposure is extremely important, because consumers are low involved with these products. The fast decision-making processes of FMCG lack on product information and are moreover based on package design or other visual appearances (van Rompay et al., 2014). Packaging are often the most distinguished and important marketing effort influencing the decision-making process of the consumer, as 40 to 70 per cent of purchase intention is formed in the store (Van Ooijen, 2016). Therefore, companies spend more money on packaging than on advertising (Schoormans & Robben, 1997).

Because of these effects, packaging for FMCG-products are very important, it consists of typographical, figurative and abstract images, or a combination of these elements and is intended to create positive associations in the minds of consumers (Buttle & Westoby, 2006; Aaker & Keller, 1990). The current study focuses on these communicative functions of a product's appearance through its packaging rather than on technical packaging functions. The effects of two variables (verticality and longitudinality) in packaging on consumer response are described in the following sections.

2.2 Influence of verticality cues

Companies deal with a lot of competitors in the marketplace when it comes to reaching the consumer. Consequently, packaging must first attract the customers attention (also called bottom-up attention) (Krishna, Cian & Aydinoglu, 2017). To interact with the consumer, perceptions such as taste, quality and price are involved in the aesthetics of products packaging, in the form of certain pictures, colors or typeface. Given the plethora of competitors and the restrictions in the type and amount of

information that can be placed on packages, marketers spend a lot of money on finding new ways that have a positive effect on consumers' responses (Cian, Krishna & Elder, 2014; Aaker & Keller, 1990; Machiels & Orth, 2017). According to Machiels and Orth (2017) metaphorical concepts in packaging are gaining interest, especially metaphors involving spatial representations.

For a long time, we have been using metaphorical associations, like vertical-space positioning (i.e., the number of printed books every year is going *up'* and 'if you are too hot, turn the heat *down'*) (Lakoff & Johnson, 1980). Several studies have investigated the relation between constructs, such as power, valance, luxury and metaphorical associations (Cian, 2016). Schubert stated that these metaphors are cases of 'control is *up*' and 'lack of control is *down*', which means: high power equals up (2005). In other words, these metaphors describe power in a vertical related dimension (Schubert, 2005; Machiels & Ort, 2017). Since this study will focus on verticality cues in designs to influence 'taste intensity' perception, *up* and *down* are mostly used as metaphor when we talk about 'more and less (intensity)' (Lakoff & Johnson, 1980), but how can marketers implement visual metaphors into packaging? Deng and Kahn, for instance, showed that the location of the product image (top or bottom) on a package influences consumers' perception of the visual heaviness of the product (2009). Subsequently, van Rompay et al., (2014) showed that also the purchase intention of the consumer was higher when the imagery on the package design was located in the top-left, instead of bottom-right. Besides, this study showed also that a package design with an upward movement was evaluated as more attractive and beautiful, rather than downward. Additionally, Machiels and Ort (2017) demonstrated that consumers perceive a product as more powerful when the label on the package is placed in a higher (vs. lower) vertical position. Verticality also plays a role in perceived attractiveness. A study of Meier and Dionne (2009) showed that females rated males as more attractive when their images appeared near the top of a screen. These findings mentioned above, showed that spatial positions in designs (more specific: upwards movements) have a positive influence on consumer responses. Speaking of verticality in spatial positions, verticality can also be implemented in visual design, such as vertical cues (stripes). For example, study of van Rompay, van Hoof, Rorink and Folsche (2019) tested 2 ad-displays with vertical and horizontal visual cues. Results showed that participants gave higher ratings on taste intensity and luxury perception when they were exposed to an ad-display with vertical oriented visual cues rather than horizontal oriented visual cues.

Given that verticality is not entirely tested, in particular verticality in visual cues, it is important to conduct more research into the influence of verticality cues in designs to get a better understanding of the effects on consumer behavior. Van Rompay et al., (2014) mentioned that verticality cues pertaining to power have an effect on low-involvement products, such as food items, which is central to this study. According to the literature the following hypotheses have been formulated:

H1: Packaging with vertical visual cues, as opposed to horizontal visual cues, will positively influence consumer responses

H1a: Packaging with vertical visual cues, as opposed to horizontal visual cues, will lead consumers to experience the product taste as more intense.

H1b: Packaging with vertical visual cues, as opposed to horizontal visual cues, will positively influence taste liking.

H1c: Packaging with vertical visual cues, as opposed to horizontal visual cues, will lead consumers to experience the product taste as more complex.

H1d: Packaging with vertical visual cues, as opposed to horizontal visual cues, will lead consumers to experience the package as more attractive.

H1e: Packaging with vertical visual cues, as opposed to horizontal visual cues, will positively influence consumers' purchase intention.

2.3 Influence of longitudinality

The physical form or design of a product is an important determinant of its marketplace success. A good design attracts consumers to a product and communicates with them (Bloch, 1995). Therefore, more and more researchers investigate the effects of form or design of product packaging. In this section the role of longitudinality in packaging cues will be described. Longitudinality will occur when cues are presented on a packaging that is stretched. For example, when vertical cues are presented on a standing rectangular packaging, the cues are longitudinal (e.g. relating to the length). When vertical cues are presented on a lying rectangular package, the cues are lateral (e.g. lateral is to the side, pertaining to the side). To understand the effect of longitudinality in packaging, literature in the field of package form and shapes are studied.

Earlier studies showed that the shape of a package has an impact on taste evaluations and consumer responses (Van Doorn, Woods, Levitan, Wan, Velasco, Bernal-Torres & Spence, 2017). According to literature, consumers' product evaluations and choices are influenced by the visual appearance of product design (Creusen & Schoormans, 2005). Several authors considered the role of verticality cues in packaging on consumers' evaluations, such as taste experience or purchase intention. (Machiels & Orth, 2017; van Rompay, de Vries, Bontekoe & Tanja-Dijkstra, 2012).

To the best of the author's knowledge, the influence of longitudinality in packaging on consumer responses has not been studied. The author thinks that longitudinal designs, more than lateral designs, might positively influence consumer responses. On the assumption that longer cues also are perceived as stronger. This study will investigate the effect of longitudinality on taste experience, perceived attractiveness and purchase intention. Therefore, the following hypotheses are conducted:

H2: Longitudinality, as opposed to laterality, in packaging will positively influence consumer responses.

H2a: Longitudinality, as opposed to laterality, in packaging will lead consumers to experience the product taste as more intense.

H2b: Longitudinality, as opposed to laterality, in packaging will positively influence consumers' perceptions of taste liking.

H2c: Longitudinality, as opposed to laterality, in packaging will lead consumers to experience the product taste as more complex.

H2d: Longitudinality, as opposed to laterality, in packaging will lead consumers to experience the packaging as more attractive.

H2e: Longitudinality, as opposed to laterality, in packaging will positively influence consumers' purchase intentions.

2.4. Congruency

There are different properties and features of product packages that influences consumer responses. Besides the individual product features, congruence between different elements is also an important determinant of consumer responses (van Rompay & Pruyn, 2011). Based on the processing fluency theory, congruency is perceived when different elements are: unity and visually fluent, this generally leads to more positive evaluations (Reber, Schwarz & Winkielman, 2014; van Rompay & Pruyn, 2011). Various studies show that congruence between visual elements have a positive effect on consumers' responses like perceived attractiveness, product value and purchase intention (Hekkert, 2006; Winkielman, Schwarz, Reber & Fazendeiro, 2000). Moreover, findings suggest that elements that are high in congruence can be effortlessly processed and are generally visually more attractive, credible and solid evaluated, as opposed to incongruent elements. (Reber et al., 2004). Elements that are incongruent need more elaborate cognitive thinking, and are therefore seen as thrilling and interesting (Dahlén, Lange, Sjödin & Törn, 2005; van Rompay & Pruyn, 2011). For example, van Rompay et al. (2010) showed that congruence between image portrayal and textual descriptions in an online hotel advertisement had more positive attitude ratings, as opposed to incongruence between text descriptions and image portrayal.

To predict consumer responses in this research, the congruity theory is used. Therefore, is it expected that when there is congruence between verticality cues and longitudinality, there will be a positive

influence on taste experience, perceived attractiveness and purchase intention. Hence, the following hypothesis is formulated:

H3: Congruency between verticality cues and longitudinality in packaging positively influences taste experiences, perceived attractiveness and purchase intention.

2.5 Taste evaluation

Product design is an important determinant in consumers preferences and choices. Even though design (inclusive or aesthetic) has been studied for centuries, there continues to be a great deal of uncertainty or ambiguity concerning design and people's reaction to it (Veryzer, 2010). According to Westerman, Sutherland, Gardner, Baig, Critchtley, Hickey, Mehigan, Solway, & Zervos (2013), aesthetic preferences related to packaging design influence consumers' product attitude and with that taste evaluation.

Humans are able to distinguished their taste perception into five different taste categories: sweet, sour, salty, bitter and umami (i.e. "tasty" or "delicious") (Ikeda, 2002). Even though we consume food and beverages on a daily basis, it is hard to differentiate one taste from another by using only taste (Krishna, 2012). This food evaluation is described as the awareness of the psychological effects of interacting with a product (Schifferstein et al., 2012), wherein one can see large individual different experiences (Chen & Engelen, 2012). Since this research focusses on the effect of packaging on taste evaluations, it is already known for a long time that consumers' taste evaluation is influenced by packaging through text, color and images (Cardello, 1994; Schifferstein, Fenko, Desmet, Labbe & Martin, 2012). Smets and Overbeeke tested if taste of a dessert can be expressed on packaging. To test this hypothesis subjects were asked if they could match ten dessert and ten packaging designs. The results show that people are able to match deserts and packaging design. This might be an indication that designers are able to transpose information from one perceptual system to another and that people are sensitive to this information (1995). More research showed the influence of packaging on taste experiences. A study by Becker, van Rompay, Schifferstein & Galetzka, demonstrated that an angular packaging shape positively influenced the taste intensity perception of yoghurt (2011). Looking into the concept of lay-outs of designs, verticality cues in packaging designs creates a more intense and liking taste evaluation of coffee (van Rompay et al., 2019).

In this present study verticality cues are used in packaging to positively influence taste evaluation in the form of taste intensity, liking and complexity. It is expected that vertical cues as opposed to horizontal cues lead to a more positive taste evaluation. Thereby, longitudinal in package form is tested to see if this will strengthens the evaluations.

2.6 Perceived attractiveness

Perceived attractiveness is usually defined in literature as “the appreciation of an object in terms of beauty” (Celhay & Trinquecoste, 2014, p. 1015). The perceived attractiveness is based on the visual aspects of product design that lead to hedonic responses with the customer. Packaging are mostly meant to be visually attractive to customers, because attractiveness guides behavior (Orth & Crouch, 2014). Attractive packages capture awareness (Cian, Krishna & Elder, 2014), generate liking (Cho & Schwarz, 2010), lead to a higher willingness to pay for (Bloch, Brunel & Arnold, 2003) and trigger an immediate desire to purchase the product (Reimann, Zaichkowsky, Neuhaus, Bender & Weber, 2010). The positive influence of perceived attractiveness of a product design on purchase intention was already earlier hypothesized by Bloch (1995). Nowadays, “a considerable amount of research also suggest that visual appreciation is an important determinant of consumer preferences, with many studies demonstrating the positive impact on product perceived value, and therefore on consumer purchase intention, satisfaction and loyalty” (Celhay & Trinquecoste, 2014, p. 1015). For example, van Rompay et al., (2014) showed that an imagery located in the top left on the packaging, instead of bottom-right, lead to higher purchase intention of the consumer. Thereby, results showed also that a packaging with an upward movement was evaluated as more attractive and beautiful.
Knowing this, it is expected that high perceived attractiveness lead to a higher purchase intention of the product.

2.7 Purchase intention

Purchase intention is the implied promise to one’s self to buy the product (again) whenever one makes the next trip to the market (Fandos & Flavian, 2006) and is based on consumers’ personal feelings, psychological perception and affective emotions (Cheng & Huan, 2018). Before the consumer is able to choose a product, they are looking for information that says something about the product. This information can be found in intrinsic and extrinsic factors. Intrinsic characteristics relate to aspects of the product such as color, aroma, and flavor, whereas extrinsic characteristics are related to the detached product characteristics (e.g. name, design, price) (Bernués, Olaizola & Corcoran, 2003). Previous studies have already demonstrated the importance of packaging in consumers’ intention to purchase (Abadio Finco, Deliza, Rosenthal & Silva, 2009), considering that consumers have to make taste assumptions despite the fact that they have no real experiences with the taste of the product yet. Moreover, marketing managers use consumer purchase intentions as an input for decisions about new and/or existing products and services. Purchase intentions data can assist companies in their marketing decisions related to product demand (new and existing products), market segmentation and promotional strategies (Morwitz, 2014).

This study aims to investigated the importance of an extrinsic characteristic (packaging) of throat pastilles on consumer intention to purchase by taking into account consumers' taste evaluation (intrinsic characteristic) and perceived attractiveness. Finally, the following hypotheses are conducted:

H4a: Taste experience will have a contribution on purchase intention

H4b: Perceived attractiveness will have a contribution on purchase intention

2.8 Conceptualization

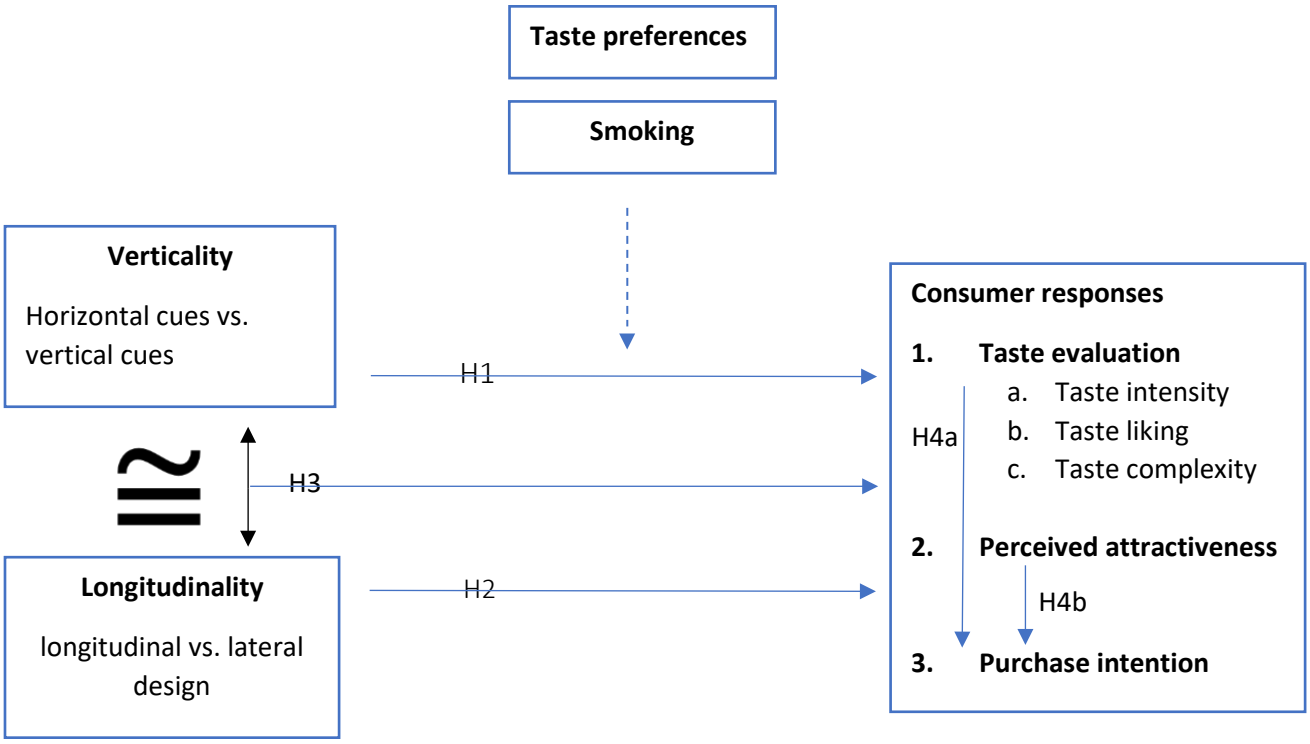

Figure 1. Conceptual model

3. METHOD

The purpose of this study is to investigate the effect of verticality of cues and packaging on taste experiences. This section of the paper elaborates the research design and accountability of the stimulus material used in this research.

3.1 Research design

The conducted research is an experimental 2x3 design with six conditions. An experiment has been chosen because it gives a good insight in the cause-and-effect relationship by manipulating each condition and demonstrating which outcome occurs. The goal of this experimental research is to answer the main question: What is the effect of verticality and longitudinality in packaging on consumer responses? Two independent variables are included, namely verticality (vertical cues vs. horizontal cues) and longitudinality (longitudinal vs. lateral vs. neutral packaging) The dependent variables of this research are 'taste experience, 'attractiveness of packaging' and 'purchase intention'. Hence, the study design looks as follow: 2 (horizontal cue vs. vertical cue) x 3 (longitudinal vs. lateral vs. neutral packaging). All 6 conditions of this research are shown in table 1 below.

Table 1. Experimental conditions

	Longitudinality		
Verticality cues	Longitudinal	Lateral	Neutral
Vertical	Condition 1	Condition 2	Condition 5
Horizontal	Condition 3	Condition 4	Condition 6

3.2 Pre-tests

To develop reliable stimuli two pre-tests are conducted. In the first pre-test the influence of the design of different vertical cues on the expected taste experience is tested. In total, 10 different cues were designed (5 vertical cues and 5 horizontal cues) in order to measure which design gives the most expected intense/powerful taste feeling. To eliminate the possible effect of longitudinality and laterality of the cues, which occurs by horizontal or vertical packaging, only a neutral packaging (squared) is used in the pre-test. With this, the level of intensity is only influenced by the design of the cues. Each design has the same picture of pastilles on its cover and the same brand logo (Q's).

3.2.1 Pre-test 1

The pre-test is distributed in two conditions. In condition 1, the respondents only saw the designs with vertical cues and in condition 2, only the designs with horizontal cues. To choose the most representative design, that is associated with intensity, 5 different designs were ranked on dimensions as strong, weak, powerful, savorless, intense, boring, fresh and mild. Respondents were asked to rank the 5 visual elements, from 1 to 5, according to their expectations. (1: fits the best with their expectation … 5: fits most badly with their expectation) The used stimulus material is showed in figures 2 and 3, below.

In total, a number of 30 respondents with an age from 16 to 61 (mean age was 30), have participated in the pretest. 63% were female. The results of the pretest are presented in appendix A and show no significant difference between the expected taste experiences for the different stimuli.

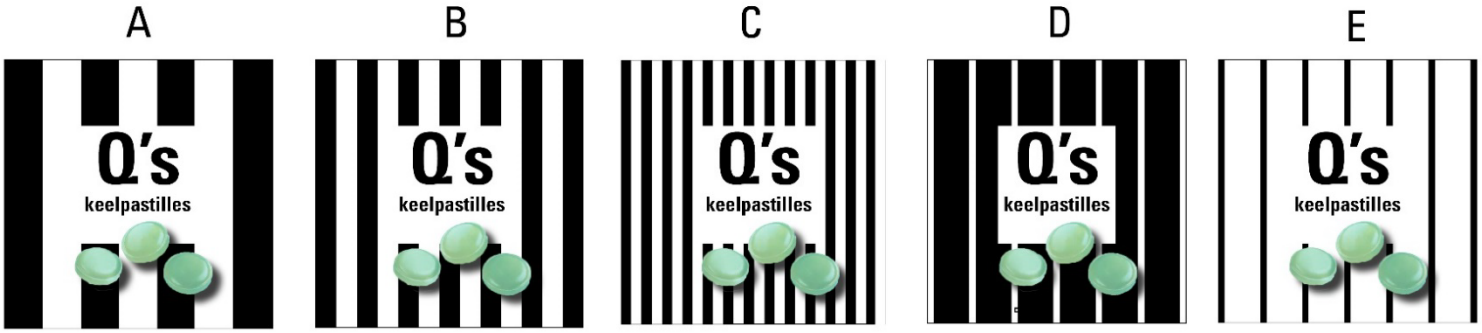

Figure 2. Stimuli vertical cues pre-test 1.

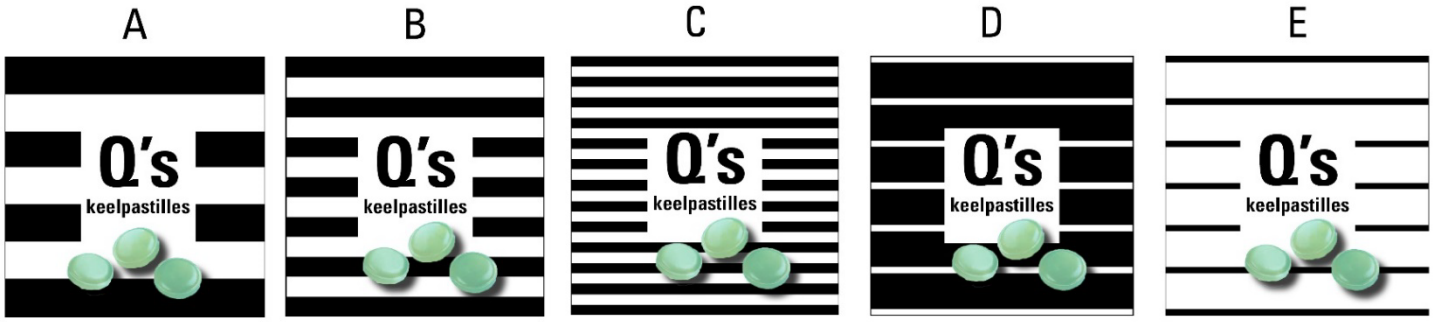

Figure 3. Stimuli horizontal cues pre-test 1.

3.2.2 Pre-test 2

A second test was conducted to see if a suggestion of movement in designs will lead to more powerful designs. In the second pre-test 14 designs, presented both horizontally and vertically, were tested (28 stimuli in total). In the second pre-test, 3 of the designs were re-used from the first pre-test (without suggestion of movement) and the other 11 were new (with suggestion of movement). The second pre-test was set out in a Q-sort. Respondents were asked to rank the designs based on a scale from -3 (less intense taste expectation) till 3 (most intense taste expectation). To choose the most representative design, that is associated with intensity, respondents were asked to rank the designs by the Q-sort method with a range from -3 till 3 (-3= weak, boring, mild taste expectation…3= strong, powerful and intense taste expectation). The used stimulus material is showed in figures 3 and 4, below.

In total, a number of 15 respondents with an age from 20 to 54 (mean age was 31), have participated in the pretest. 60% were female.

Figure 4.: Vertical designs 1 till 14 pre-test 2.

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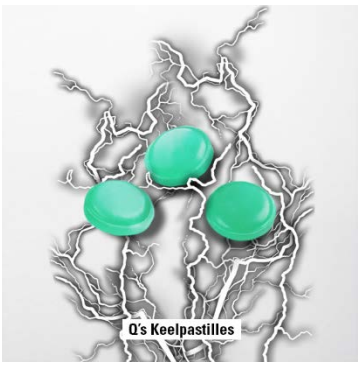
9. 

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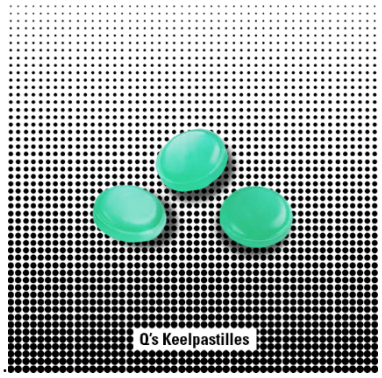
11. 

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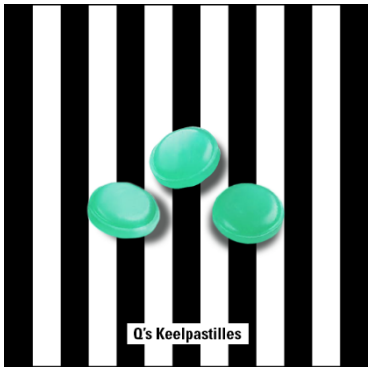
13 . 

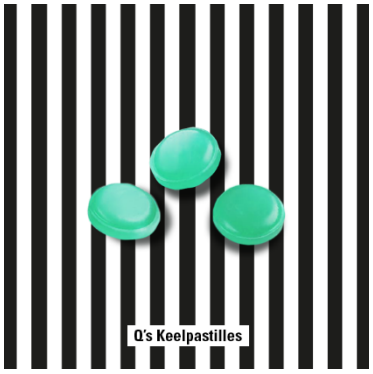
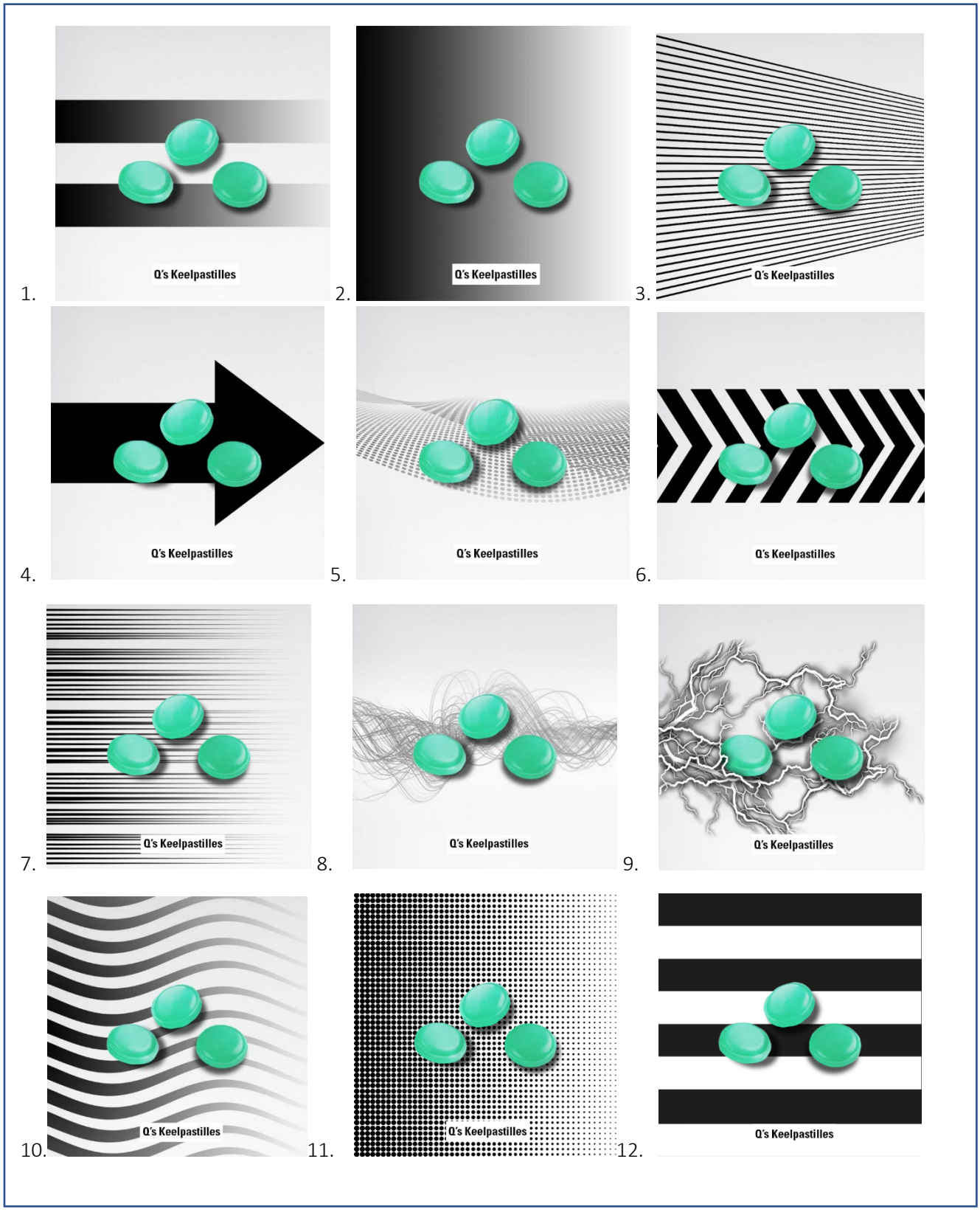
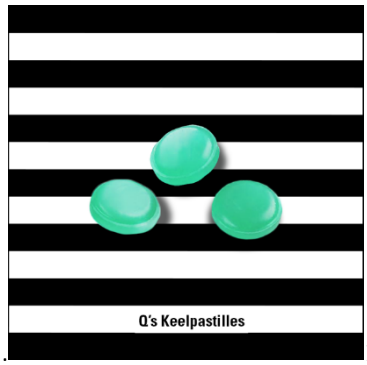
14 

Figure 5. Horizontal designs 1 till 14 pre-test 2.



13. 

14. 

3.2.3 Results and discussion

Table 2. Results Q-sort most powerful design pre-test 2

	Horizontal cues		Vertical cues	
Designs	Mean	*SD*	Mean	*SD*
1. Stripes gradient	-.20	1.01	-.13	.92
2. Gradient	-.87	1.46	-.20	1.97
3. Perspective	-.60	1.24	.27	1.03
4. Arrow	-1.07	1.28	-.73	1.28
5. Wave	-1.60	1.50	-1.07	1.83
6. Movement	.07	.88	.07	1.49
7. Speed	-.53	1.30	-.60	1.59
8. Tornado	-.80	1.86	-.40	1.99
9. Thunder	-.20	1.90	.20	2.21
10. Wavy lines	.47	1.19	1.20	1.37
11. Dots	.47	1.06	0.13	1.25
12. Broad lines	.87	1.96	1.60	1.72
13. Middle lines	.87	1.77	1.53	1.30
14. Narrow lines	.53	1.64	0.67	1.35

The outcomes of the conducted pre-test were analyzed and the results are presented in table 2 above. Results from the second pre-test show that design 12 ('Broad lines') was considered to be as most intense/powerful. This design scored highest in both, vertical (*M* = 1.60, SD = 1.72), and horizontal (*M* = .87, SD = 1.96) design. Therefore, design 12 will be used in the main study.

Overall, the vertical cues are perceived as more powerful compared to the horizontal cues, which is align with the literature. Designs with suggestion of movement (design 1 till 11) are not perceived as more powerful compared to static designs (12 till 14). A suggestion of movement in designs might be perceived as more powerful when it has more contrasting (background) colors.

4. MAIN STUDY

In the main study, the possible effects of verticality cues in packaging on the taste experiences is investigated. In this section, the stimulus material, procedure, measures, participants and reliability is described.

4.1 Stimulus material and design

For the main study, verticality cues were used in different designs: Vertical design, squared design and horizontal design. In total, 6 packages (stimuli) will be tested. This study uses a fictitious brand name/logo and all packages have the same color and volume, to exclude any other variable that might interfere with the stimuli of interest.

Figure 6. Congruent condition: longitudinal (vertical vs. horizontal cues).

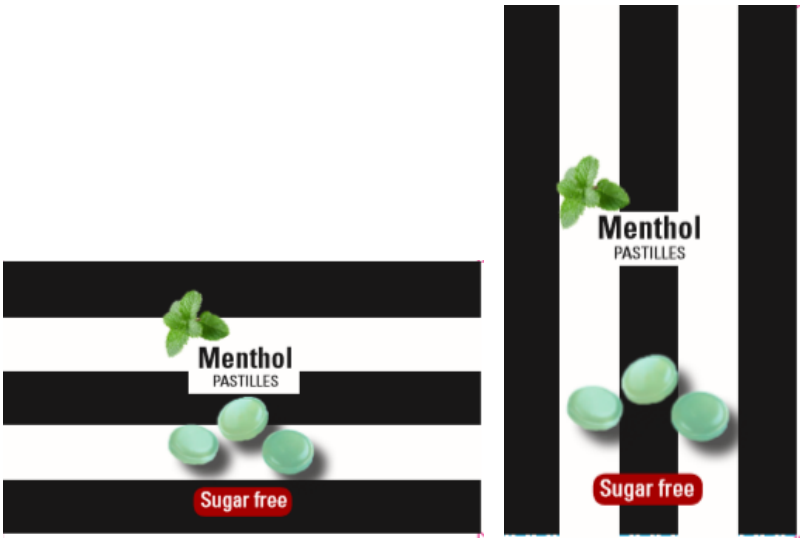


Figure 7. Incongruent condition: Lateral (vertical vs. horizontal cues).

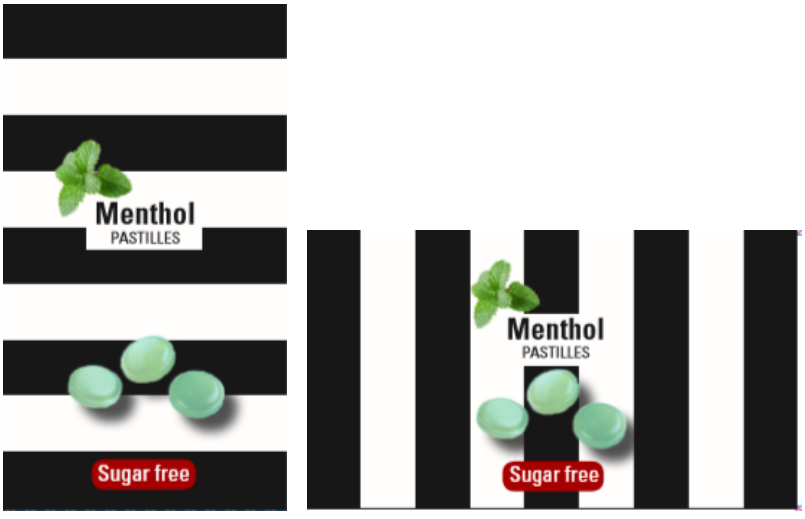
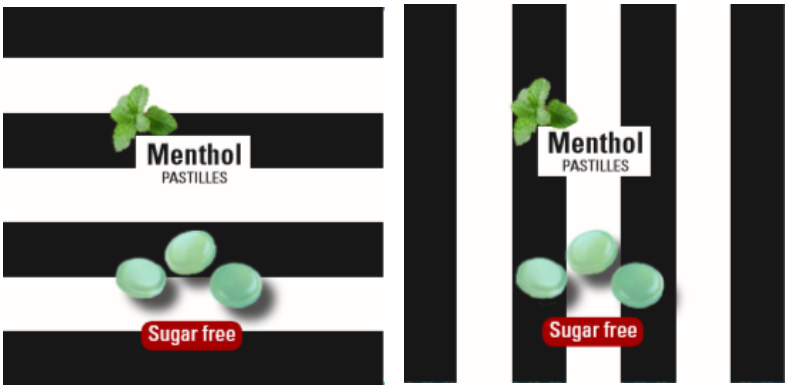


Figure 8. Neutral condition (vertical vs. horizontal cues).



4.2 Procedure

The used tool for this research is Qualtrics, because this is easy in use and can automatically converse the answers of the questionnaire into a SPSS file. Furthermore , this tool prevents an interviewer bias. The questionnaire was dived into 6 conditions according to the stimuli. The respondents were exposed to 1 of the 6 stimuli and were asked to taste the throat pastille and fill in the questionnaire. The respondents were told that a new brand of throat pastilles is in development and that their opinion about the taste experience is valuable. However, it was not told that the survey measured the effect of verticality cues in packaging on consumer responses, to ensure the reliability of the study. In the introduction, participants were informed about the anonymity of their answers and that participation for this study was voluntarily. Respondents remained the right to terminate the participation at any time in the study. Furthermore, in the introduction the following demographic questions are asked: Gender (Male/Female), Age (18-25, 26-33, 33-41, 42-65), level of education (vmbo, havo, vwo, mbo, hbo, wo, wo-master).

In the second phase of the survey, the respondents were asked to rate the taste and package of the throat pastille in terms of taste experience, attractiveness of packaging and purchase intention, using a seven-point Likert scale, where 1 stands for strongly disagree and 7 stands for strongly agree. At the end of the questionnaire a manipulation check was used to test if the experimental stimuli were effectively manipulated and some moderator question were asked. After the data was collected, the data was analyzed with use of SPSS.

4.3 Measures

In this section the dependent variables, manipulation check and control questions are described. The complete survey can be found in Appendix B.

4.3.1 Taste experience

The construct taste experience measures the evaluation of the throat pastilles on 3 different levels, namely taste intensity, taste complexity and taste liking.

To measure the effect of the independent variables on taste experience, multiple items were formulated. These items measures how the participants perceived the taste of the throat pastille. The taste intensity, based on a study of van Rompay, van Hoof, Rorink, & Folsche (2018), was measured using the dimensions, 'strong', 'powerful', 'weak' (r), 'intense' and 'flat' (r). Participants had to indicate to what extent they considered these items descriptive for the taste of the throat pastille. The responses of the participants were recorded on a 7-point Likert scale (1= Strongly disagree ... 7= Strongly agree).

The second construct contains items to measure the taste liking based on a study of Fenko, Backhaus & Van Hoof (2015). Four, seven-point Likert-type items are used in this scale to measure the degree to which a person describes a food or beverage as being pleasurable to consume (1= Strongly disagree ... 7= Strongly agree). The items included good taste, unpleasant to eat (r), enjoy eating the throat pastille and the pastille has a pleasant structure. Respondents had to rank the items on a 7-point Likert scale, ranging from strongly disagree to strongly agree.

The last indicator of taste experience is 'Taste complexity', which is measured by the items 'The taste is complex', 'The throat pastille has a rich taste' and 'The taste of the throat pastille is balanced'. This is also measured on a 7-point Likert scale (1= Strongly disagree ... 7= Strongly agree).

4.3.2 Attractiveness of packaging

Three, seven-point Likert scale items (1= Strongly disagree ... 7= Strongly agree) are used in this scale to measure the degree to which something is viewed as being visually pleasant. The instrument used to measure the attractiveness is derived from Bruner (2012), consisting of the following 3 items: 'attractive', 'appealing' and 'good-looking'.

4.3.3 Purchase intention

To measure the purchase intention, a set of three items was formulated. This construct measure the degree a consumer intends to buy the product. This will be measured on a 7 point-Likert scale (1= Strongly disagree ... 7= Strongly agree) by 3 item: 'I would consider buying this throat pastille at the supermarket', 'I would recommend this throat pastille to my friends' and 'I would like to receive a test package'.

4.4. Control questions

To test whether the study measured the experimental stimuli effectively, a manipulation check was used. Respondents were exposed to two manipulation check questions at the end of the questionnaire and were asked if the stripes on the package were horizontal or vertical and if the package was standing, lying or squared.

4.5 Covariates

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 mint is seen as a covariate in this research. To measure the taste preferences, the participants had to indicate to what extent they agreed with the statements 'I like eating mint', 'I like strong flavors' and 'I like intense flavors'. Responses will be measured on a 7-point Likert scale ranging from 1= totally disagree – 7= totally agree. Additionally, the participants had to fill in how many times a week they consume food or beverages with mint taste, because this could influence their perception of intensity or likeness. At last, participants were asked if they smoke on a daily basis, in case this will influence their taste ability.

4.6 Manipulation check

To test whether the study measured the experimental stimuli effectively a manipulation check was used. Participants were presented with two manipulation check questions at the end of the questionnaire and were asked if the stripes on the package were horizontal of vertical oriented (1) and what the form of the package was (squared, standing or lying)(2). The manipulation checks were analyzed using a chi-square test and all effects were statistically significant at the p <.05 significance level. From the

manipulation check it can be concluded that all the manipulations succeeded, because the differences of the first question were significant χ^2 (1, *N* = 185) = 165.56, *p* <.001). Furthermore, results from the manipulation check showed that the differences of the second control question were also significant χ^2 (4, *N* = 185) = 329.79, *p* < .001).

Table 3. Manipulation check

Manipulation check	*df*	Sig.
Vertical/horizontal cues	1	< .001
Form of package	4	< .001

4.7 Participants and randomization check

For the main study, 185 respondents participated in this research, distributed over six experimental conditions. 12 respondents were removed after the manipulation check and 1 outlier was removed. After cleaning up the data set, 172 respondents were involved in the further data analysis. Gender (73 male, 99 female) was not equally distributed in the population, χ^2(5, *N* = 172) = 14.95, *p* = .01. The average age of participants was between 36 and 45 years old, with the youngest participant being 25 or younger and the oldest 65 or older. The age was also not equally distributed in the population, χ^2(25, *N* = 172) = 45.73, *p* = .01). The level of education is categorized into 3 labels: low (*N* = 64), middle (*N* = 66) and high (*N* = 42) level of education (CBS, 2017). These frequencies were significant different among the conditions, χ^2(10, *N* = 172) = 25.69, *p* = < .001). The percentage of participants that smoked did not differ by conditions, χ^2(5*, N* = 172) = 3.14, *p* = .68). Of all 172 respondents, 28 respondents were exposed to the condition 'Horizontal + Squared", 26 respondents were exposed to the condition "Vertical + Squared", 28 respondents were exposed to the condition "Vertical + Longitudinal", 29 respondents were exposed to the condition "Horizontal + Lateral", 31 respondents were exposed to the condition "Vertical + Lateral" and 30 respondents were exposed to the condition "Horizontal + Longitudinal". Table 4 shows the demographic information of the participants per condition.

Table 4. Demographics of participants for each condition of packaging.

	Horizontal / squared	Vertical / squared	Vertical / longitudinal	Horizontal / lateral	Vertical / lateral	Horizontal / longitudinal
						
N	28	26	28	29	31	30
Gender						
Female	18 (18.2%)	20 (20.2%)	13 (13.1%)	21 (21.2%)	11 (11.1%)	16 (16.2%)
Male	10 (13.7%)	6 (8.2%)	15 (20.5%)	8 (11%)	20 (27.4%)	14 (19.2%)
Age						
< 25	2 (7.1%)	3 (11.5%)	13 (46.4%)	9 (31.0%)	8 (25.8%)	4 (13.3%)
25-35	8 (28.6%)	7 (26.9%)	6 (21,4%)	10 (34.5%)	2 (6.5%)	10 (33.3%)
36-45	6 (21.4%)	8 (30.8%)	4 (14.3%)	5 (17.2%)	9 (29.0%)	2 (6.7%)
46-55	6 (21.4%)	5 (19.2%)	2 (7.1%)	4 (13.8%)	10 (32.3%)	5 (16.7%)
56-65	4 (14.3%)	3 (11.3%)	3 (10.7%)	1 (3.4%)	2 (6.5%)	7 (23.3%)
65 >	2 (7.1%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (6.7%)
Level of education*						
1	5 (17.9%)	5 (19.2%)	9 (32.1%)	12 (41.4%)	13 (41.9%)	20 (66.7%)
2	17 (60.7%)	13 (50.0%)	11 (39.3%)	9 (31.0%)	13 (41.9%)	3 (10.0%)
3	6 (21.4%)	8 (30.8%)	8 (28.6%)	8 (28.6%)	5 (16.1%)	7 (23.3%)
Daily smoker	2 (10.5%)	4 (21.1%)	4 (21.1%)	2 (10.5%)	5 (26.3%)	2 (10.5%)

* 1= low level of education, 2= middle level of education, 3 = high level of education.

4.8 Reliability

The Cronbach's Alpha value is calculated for the used items to measure the taste experience, perceived attractiveness and purchase intention. The scale reliabilities can be found in table 5. All the scales show a good reliability coefficient and therefore share covariance in measuring the same concept. Except for the construct taste complexity where alpha is smaller than the appropriate score ($\alpha < .70$). Factor analysis is performed to see how the items of 'Taste complexity' are correlated. In these results, a varimax rotation was performed on the data. 'The throast pastille has a rich taste' (De keelpastille heeft een rijke smaak) (.872) + 'De taste of the throatpastille is balanced' (De smaak van de keelpastille is gebalanceerd) (.804) have large positive loadings on factor 1 and 'The taste of the throatpastille is complex' (De smaak van de keelpastille is complex) (0.931) has large positive loadings on factor 2. For

the construct ‘taste complexity’, only the item ‘The taste of the throatpastille is complex’, will be used in further analysis, because of the reliability of the construct.

Table 5. Construct reliability

Construct	α	*N*	*Items removed*
Taste experience			
Taste intensity	.81	6	0
Taste liking	.82	4	0
Taste complexity	n/a	1	2
Perceived attractiveness	.90	3	0
Purchase intention	.84	3	0

5. RESULTS

This chapter describes the main results gathered from the survey. The data is analyzed using the ANOVA test in SPSS, which test the influence of verticality cues and longitudinality in packaging on taste experience, perceived attractiveness and purchase intention. The findings of these analyses are presented below for each construct and summarized in table 6.

5.1 Taste experience

Taste intensity

There was no significant main effect of verticality on taste intensity, $F(1, 172) = .004$, $p = .95$. Thereby, further analysis of the results show no significant effect of longitudinality in design on taste intensity, $F(1, 172) = .83$, $p = .44$. Also no interaction effect was visible between verticality * longitudinality on taste intensity, $F(1, 172) = 1.77$, $p = .17$. Additionally, a significant effect of the covariates on taste intensity is visible, $F(1, 172) = 3.92$, $p = .05$). This result shows that taste preferences and being a smoker or not, influences the perceived taste intensity.

Taste liking

The verticality cues in packaging seems to have no significant main effect on taste liking, $F(1, 172) = 0.64$, $p = 0.43$). Also, longitudinality showed no significant effect on taste liking, $F(1, 172) = 0.19$, $p = .83$. Furthermore, no interaction effect was visible between verticality * longitudinality on taste intensity, $F(1, 172) = 1.67$, $p = .19$). Additionally, results showed a significant effect of the covariates on taste liking, $F(1, 172) = 43.2$, $p = < .001$). This means that taste liking is influenced by respondent's taste preferences and being a smoker or not.

Taste complexity

As for the dependent variable 'taste complexity', an univariate ANOVA was conducted. This demonstrated no significant effect of verticality on taste complexity, $F(1, 172) = .18$, $p = .68$. Also, longitudinality showed no significant effect on taste complexity, ($F(1, 172) = 1.13$, $p = .33$. In this case, the covariates had no significant effect on taste complexity, $F(1, 172) = .37$, $p = .55$. Further, there is no significant main effect between the independent variables (verticality * longitudinality), $F(1, 172) = .18$ $p = .84$.

5.2 Perceived attractiveness of packaging

The influence of verticality cues in packaging seems to have no significant main effect on the perceived attractiveness of the packaging, (F(1, 172) = 2.33, *p* = .13. Also, longitudinality showed no significant effect on taste liking, *F*(1, 172) = 0.44, *p* = .64. The interaction effect between verticality * longitudinality was not significant, *F*(1, 172) = 0.15, *p* = .86.

5.3 Purchase intention

Lastly, the effect of verticality cues in packaging on purchase intention was not statistically significant, F(1, 172) = .35, *p* = .56. Further analysis revealed no main effect of longitudinality on purchase intention, F(1, 172) = .004, *p* = .99. Thereby, there is no significant interaction effect (verticality * longitudinality) on purchase intention, F(1, 172) = .21, *p* = .81. However, there was a significant effect visible from the covariates on purchase intention, F(1, 172) = 18.58, p = < .001). This effect shows that purchase intention is influenced by taste preferences and smoker status.

Table 6. Results of the univariate ANOVA for all variables

Factor	Verticality cues		Longitudinally design		Verticality * Longitudinality	
	F	Sig.	F	Sig.	F	Sig.
Taste intensity	.001	.97	.94	.39	1.77	.17
Taste liking	.64	.43	.19	.83	1.67	.19
Taste complexity	.18	.68	1.13	.33	.18	.84
Perceived attractiveness	2.33	0.13	.44	.64	.15	.86
Purchase intention	.34	.56	.004	.99	.21	.81

Table 7. Mean scores per manipulation

	Verticality		Longitudinality		
Factor	Vertical cues	Horizontal cues	Longitudinal	Lateral	Squared
Taste intensity	*M* = 5.20 SD = .10	*M* = 5.20 SD = .10	***M* = 5.28** SD = .12	*M* = 5.08 SD = .12	*M* = 5.26 SD = .13
Taste liking	***M* = 5.41** SD = .09	*M* = 5.31 SD = .09	*M* = 5.38 SD = .11	***M* = 5.39** SD = .11	*M* = 5.30 SD = .12
Taste complexity	***M* = 3.34** SD = .41	*M* = 3.26 SD = .41	***M* = 3.50** SD = .17	*M* = 3.15 SD = .17	*M* = 3.24 SD = .18
Perceived attractiveness	*M* = 3.83 SD = .16	***M* = 4.17** SD = .15	***M* = 4.11** SD = .19	*M* = 3.86 SD = .19	*M* = 4.03 SD = .19
Purchase intention	*M* = 4.59 SD = .14	***M* = 4.70** SD = .13	*M* = 4.64 SD = .163	***M* = 4.66** SD = .16	*M* = 4.65 SD = .17

5.4 Additional analyses

To see if there are significant main effects for congruent combinations (longitudinal conditions) a univariate ANOVA test was performed. This analyses showed no significant effect of congruence on the dependent variables. See table 8 for the mean scores per condition.

Table 8. Congruence between variables

	Horizontal / squared	Vertical / squared	Vertical / longitudinal	Horizontal / lateral	Vertical / lateral	Horizontal / longitudinal
						
Taste intensity	*M* = 5.20 SD = 1.00	*M* = 5.30 SD = .82	*M* = 5.11 SD = 1.12	*M* = 4.92 SD = 1.04	*M* = 5.23 SD = .77	*M* = 5.46 SD = .73
Taste liking	*M* = 5.21 SD = 1.05	*M* = 5.37 SD = .90	*M* = 5.60 SD = .80	*M* = 5.40 SD = .78	*M* = 5.40 SD = 1.00	*M* = 5.12 SD = 1.09
Taste complexity	*M* = 3.18 SD = 1.31	*M* = 3.31 SD = 1.26	*M* = 3.61 SD = 1.12	*M* = 3.21 SD = 1.42	*M* = 3.13 SD = 1.41	*M* = 3.37 SD = 1.10
Perceived attractiveness	*M* = 4.12 SD = 1.13	*M* = 3.92 SD = 1.51	*M* = 3.83 SD = 1.51	*M* = 4.06 SD = 1.46	*M* = 3.72 SD = 1.49	*M* = 4.34 SD = 1.33
Purchase intention	*M* = 4.60 SD = 1.27	*M* = 4.67 SD = 1.26	*M* = 4.56 SD = 1.54	*M*= 4.79 SD = .91	*M* = 4.60 SD = 1.47	*M* = 4.68 SD = 1.39

5.5 Regression analysis

A multiple regression was calculated to predict participants purchase intention based upon their taste intensity, taste liking, taste complexity and perceived attractiveness. The regression analysis, see table 9, showed that taste intensity, taste liking and perceived attractiveness have an effect on purchase intention. However, taste complexity have no significant contribution to predict purchase intention.

Table 9. Linear model of predictors of purchase intention. 95% confidence intervals reported in parentheses.

	b	SE *B*	β	*p*
Model 1				
Constant	-1.30 (-2.39, .21)	.55		.02
Taste intensity	.25 (.09, .41)	.08	.18	< .001
Taste liking	.88 (.72, 1.03)	.08	.64	< .001
Taste complexity	-.01 (-.13, 1.00)	.06	-0.1	0.83
Model 2				
Constant	-1.42 (-2.37, -.47)	.48		0.1
Taste intensity	.13 (-.01, .27)	.07	.09	.07
Taste liking	.76 (.63, .90)	.07	.55	< .001
Taste complexity	-.03 (-0.13, .06)	.05	-.03	.49
Perceived attractiveness	0.35 (.26, .44)	.05	.38	< .001

Note. R^2 = .47 for model 1: ΔR^2 = .61 for step 2 (*ps* < .001)

Individually, taste intensity, $t(167) = 1.83$, $p = .07$ and taste complexity, $t(167) = -.69$, $p = .49$, are no significant predictors of purchase intention. On the other hand, taste liking, $t(167) = 10.86$, $p = < .001$, and perceived attractiveness ,$t(167) = 7.31$, $p = < .001$, are significant predicters of purchase intention. From the magnitude of the *t*-statistics, it can be seen that taste liking had more impact than perceived attractiveness.

The results of the regression analysis indicates that taste experience (taste intensity, taste liking and taste complexity) have a contribution of 47% on the purchase intention. Furthermore, perceived attractiveness has an contribution of 14% on the purchase intention. Altogether, taste experience and perceived attractiveness have a contribution of 61% on the purchase intention. Moreover, results showed a trend regarding the influence of verticality and longitudinality on perceived attractiveness

5.6 Overview of hypotheses

	Hypotheses	Supported
H1a	Packaging with vertical visual cues, as opposed to horizontal visual cues, will positively influence consumer responses	No
H1a	Packaging with vertical visual cues, as opposed to horizontal visual cues, will lead consumers to experience the product taste as more intense.	
H1b	Packaging with vertical visual cues, as opposed to horizontal visual cues, will positively influence taste liking.	No
H1c	Packaging with vertical visual cues, as opposed to horizontal visual cues, will lead consumers to experience the product taste as more complex.	No
H1d	Packaging with vertical visual cues, as opposed to horizontal visual cues, will lead consumers to experience the product design as more attractive.	No
H1e	Packaging with vertical visual cues, as opposed to horizontal visual cues, will positively influence consumers' purchase intention.	No
H2	Longitudinality, as opposed to laterality, cues in packaging will positively influence consumer responses	No
H2a	Longitudinality, as opposed to laterality, cues in packaging will lead consumers to experience the product taste as more intense.	No
H2b	Longitudinality, as opposed to laterality, cues in packaging will positively influence consumers' perceptions of taste liking.	No
H2c	Longitudinality, as opposed to laterality, cues in packaging will lead consumers to experience the product taste as more complex.	No
H2d	Longitudinality, as opposed to laterality, cues in packaging will lead consumers to experience the packaging as more attractive.	No
H2e	Longitudinality, as opposed to laterality, cues in packaging will positively influence perceptions of consumers' purchase intention.	No
H3	Congruency between verticality cues and longitudinality in packaging positively influences taste experiences, perceived attractiveness and purchase intention.	No
H4a	Taste experience will have a contribution on purchase intention	Yes
H4b	Perceived attractiveness will have a contribution on purchase intention	Yes

5. DISCUSSION AND CONCLUSION

5.1 Main findings

The aim of this study was to find out what impact verticality cues and longitudinality in packaging have on consumer's taste evaluation and purchase intention. The focus was mainly on manipulating the taste intensity of the throat pastille, and subsequently the perceived taste complexity, taste liking, perceived attractiveness and purchase intention. Based on previous research, it was hypothesized that taste evaluations would be influenced by verticality (van Rompay et al., 2019). However, the effect of longitudinality in packaging has not been tested before.

This study did not find any significant effects for the relationship between verticality cues, horizontal cues, longitudinality, and/or laterality in packaging on the taste experience, perceived attractiveness and purchase intention.

The verticality cue manipulation did not have a significant effect on either taste experiences or perceived attractiveness and purchase intention. This in contrast to previous literature in the field of verticality, such as studies of van Rompay et al., (2019), van Rompay, Fransen, & Borgelink (2014), Machiels & Orth (2017) and Schubert (2005), where verticality evoked perceptions of power (taste intensity) and perceived attractiveness.

In general, the participants perceived taste intensity rather high, regardless of verticality. The ratings of taste liking were also high, mostly with a little more tendency to vertical cues, but no significant effect of verticality on taste liking could be detected. This can be explained by the fact that people have large individual differences in food evaluations (Chen & Engelen, 2012) and therefore can be influenced by personal feelings instead of the verticality manipulations. However, ratings of taste complexity were considerably lower, also with scores in the vertical conditions higher as opposed to horizontal conditions, but still not significant. The equal score on taste liking is against literature and could be explained by the fact that a throat pastille already has an intense taste. Participants would experience already an intense taste and cannot experience an even more intense taste. Therefore, external manipulations might not work to influence the perceived taste intensity. Based on these results, it might be assumed that the use of verticality cues to influence taste intensity would not work for products with an already intense taste. Also referenced to previous research of van Rompay et al. (2019), the use of verticality cues to influence taste intensity works for neutral products, such as coffee, wherein in generally no intense taste is perceived. Furthermore, effect of verticality cues on taste complexity did not show any significant effect. Remarkably, participants ranked this variable considerably lower than taste liking and intensity. A possible explanations could be that determining complexity of its taste is difficult when the taste of the product is intense. Further, a trend is visible in the effect of verticality

cues on perceived attractiveness. Though, it is remarkable that the horizontal scored higher than vertical condition. This can be explained by the fact that perceived attractiveness can be very personal. At last, the ratings of purchase intention were above average, with a little tendency to horizontal cues, but no significant effect could be detected. The fact that participants who saw the horizontal cues ranked higher, might be because of that horizontal cues are also perceived as more attractive. Perceived attractiveness is a strong determinant of purchase intention, which is explained later on.

Also, longitudinality did not have a significant effect on either taste experience or perceived attractiveness and purchase intention. Since no research was conducted before that measures the effect of longitudinality in designs, results of this study will enrich knowledge in this field. The results concerning the interaction effects demonstrates that the type of verticality cue in combinations with longitudinality (longitudinal, lateral or neutral packaging), had no significant effect on taste experience, perceived attractiveness and purchase intention. A possible explanation could be that the package was too small to experience the effect of longitudinality. When participants are exposed to a larger package, they will possible experience the effect of longitudinality more intense.

Remarkably, covariate 'taste preferences' showed a significant effect on taste intensity and taste liking. Participants that scored higher on the likeness of the taste mint did also rate the taste liking of the throat pastille more positive, because they have a positive feeling with this taste. When people do not like the taste of mint at all, they will evaluate the taste of the throat pastille less positive. Thereby, taste preferences also had an influence on the perceived taste intensity In other words, if you like the taste of mint, the intensity could be perceived less intense. This might be because the participant eats a lot of mint or intense products and is used to intense tastes.

The dependent variables, taste intensity, taste liking, taste complexity and purchase intention together have a predictive power of more than 60% on purchase intention. In other words, based on the influence of these variables a prediction can be made about consumers' purchase intention. Therefore, it can be concluded that verticality cues influence the purchase intention of the participants, which is inline with previous studies (van Rompay et al., 2012; Machiels & Orth, 2017). Except for taste intensity and taste complexity, a significant unique contribution in the prediction of purchase intention was found for the other variables. 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. Interestingly, the perceived attractiveness was the second variable that has a strong contribution on purchase intention. Reimann, Zaichkowsky, Neuhaus, Bender

and Weber stated that attractive designs trigger an immediate desire to purchase the product (2010). This is also visible in this study. When consumers evaluated the package as attractive, they are more willing to buy the product. Thus it can be concluded that when consumers have the opportunity to try the product before purchasing, the purchase intention is higher. Thereby, when a package is perceived as attractive the purchase intention most likely increases. Therefore, investigating in attractive packaging, for fast-moving consumer goods, is really important for companies to influence purchase intention.

5.2 Limitations and future research

As a reflection on the research, the limitations should be elaborated. The limitations have to be taken into account when considering recommendations that are derived from the research. This study adds value to the existing theoretical knowledge, especially of longitudinality, due to limited research in the field of longitudinality and its influence on consumer responses. Although, there was no research conducted before, hypotheses were based on assumptions.

At first, only Dutch respondents were recruited for this study, therefore the findings of this study cannot be generalized to other cultures than Western Europe. Due to the fact that the theory of the verticality perception ('sky is the limit') can be different across cultures. Moreover, respondents who participated in this study were mainly females between 36 – 45 years old. Findings of this study would be more representative if gender and age were equally distributed among the conditions.

Secondly, although the experiment took place at places where people had time for participating and the packaging were made as realistic as possible, the package was still somewhat experimental. Given that the participants had to taste the throat pastille at that particular moment, caused some limitations. Especially, the fact that the purchase intention of the participants was asked, but they could not actually buy the throat pastille. They just had to imagine if they consider buying if the pastille was available at the supermarket. This could explain why no significant effect for purchase intention was found in this study. Furthermore, although the packaging were designed to be as realistic as possible, it was designed by the researcher and did not represent a high quality packaging. Therefore, some evaluations of the participants might be influenced by the design of the package. Especially, the variable perceived attractiveness might be influenced by this limitations. When the packaging did not look professional and realistic, the perceived attractiveness might be influenced. For this reason, a suggestion is to use a professional design for further research. Additionally, during the taste experience, most participants immediately consumed the throat pastille before thoroughly observing the packaging, even though instructions to do so were given beforehand. Although you do not want to insist too much on observing

the package, otherwise participants will realize that the experiment is about the packaging instead of the taste of the throat pastille. However, the limitation of less attention for the packaging might have an effect on the effectiveness of the manipulation. Furthermore, it has not been checked if the manipulated packaging were credible. The packaging were designed by a researcher and not by a designer. Therefore, participants could experience the packaging not professional or credible and that can influence their product evaluation. Conversely, the throat pastille, used in the experiment, is an existing throat pastille from the supermarket (Aldi). Participants might have recognized the taste, which could influence their opinion in a negative or positive way. For future research it is recommended that a professional packaging is used with a unknown, new throat pastille, in order to prevent a bias. Thereby, a more realistic shopping environment with a direct buying opportunity is recommended for future research, in order to draw better conclusions about the effect of packaging on purchase intention.
Furthermore, in the study of van Rompay et al. (2019), participants were exposed to pictures of the packaging. However, in this study a real packaging was developed and showed to participants. This way of measuring might have been affected consumer responses since participants could have been influenced by cues other than the verticality manipulation (e.g. how the package feels or how credible it is, ingredients information on backside). Additionally, a relative small package is used in this study. It might be interesting to test the effect of verticality cues in combination with longitudinality in a somehow larger packaging, which might cause significant differences.

Another limitation is that the used taste stimuli in this study was a menthol throat pastille. The taste of this product is already intense. Therefore, an even more intense taste perception is hard to achieve through external manipulations. It would be interesting for future research to use a product with a more neutral taste, causing external manipulations (e.g. packaging) to have a stronger influence on taste evaluations.

Finally, the used designs in the pre-test all were in black and white. However, the contrast of the used designs differs, which might influence the perception of a strong package. It could be interesting for future research to test the effects of verticality in combinations with color on consumer responses. For more future research into the effect of verticality in packaging, it could be interesting to use package designs with suggestions of movement instead of static stripes, in order to influence taste intensity perception.

Whereas this study focusses on verticality cues in packaging, it could also be interesting to manipulate the verticality perception in other ways in order to influence consumer responses. For example, verticality could be used in music, which is playing on the background of the supermarket. Using music with tones from low to high, opposed to monotone music, might influence the verticality perception,

and possible intensity perception, when respondents do a taste test. Verticality can also be implemented in smell. An intense smell can be implemented in the supermarket in order to influence the taste intensity perception. Another suggestion is to implement verticality in spatial high. For example, the manipulated product high placed in the product shelf might be experienced more intense instead of a product placed low in a product shelf. Another idea is to ask people to stand on a stair during the taste test. It might be that people standing high on the stair would experience the taste more intense rather than people lower on the stair. Further, it could be interesting to put the advertisement poster high on the wall. Participants that do a taste test and evaluate the advertisement high on the wall (and look up) might be influenced more positively instead of participants who see the advertisement low on the wall (and loop down). This effect is also described by Lakoff and Johnson, which stated that high power equals up (1980), At least there are still enough options to test the effect of verticality on consumer responses, which might be interesting for companies to investigate.

5.3 Practical implications

Knowing that companies deal with a lot of competitors in the marketplace by reaching the consumer (Creusen & Schoorman, 2005; Krishna, Cian & Aydinoglu, 2017), packaging is really important, because this is the first contact companies have with their audience. The results of this study are of great value for companies and marketers and yield some interesting results in the area of purchase intention. The findings of this study suggest that taste evaluations and perceived attractiveness of packaging are important determinant of purchase intention. However, taste experience for new products is hard to evaluated without tasting the product. Therefore, it could be interesting to let consumer try the product for free in the supermarket, because a positive taste evaluation will influence their purchase intention. Furthermore, investing in an attractive package can positively influence purchase intention. Especially this effect can be of great importance for marketers who are responsible for sales optimization. However, companies should place the results of this study in the right context. This study was performed with low-involvement products. An attractive package might not have the same contribution on purchase intention when exposed to a high-involvement product.

5.4 Conclusion

The main research question of this study was: What is the effect of verticality and longitudinality in packaging on consumer responses? This study did not show any significant effect of verticality and longitudinality on taste experience, perceived attractiveness and purchase intention. This is in contrast with earlier conducted studies, arguing that verticality cues positively influence consumer responses

(van Rompay et al., 2019; Machiels & Ort, 2017). However, longitudinality in design was never tested before, it seems to have no effect on consumer responses. On the other hand, results of this study showed that taste experience and perceived attractiveness are good predictors of purchase intention. Especially taste liking seems to contribute the strongest to purchase intention. To conclude, this research is an addition to the research in field of packaging and shows that attractive packages positively influences purchase intentions. This leads to a foundation for practical implications, like investing in attractive packaging, for marketers in the food sector of low-involvement products and further research into the effects of verticality manipulations for products.

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Appendix A. Results pre-test 1.

Table 10. Mean scores vertical cues

	Strong	Powerful	Intens	Fresh	Total score
Design A	*M* = 2.00 SD = 1.04	*M* = 1.92 SD = 0.92	*M* = 2.23 SD = 1.12	*M* = 2.62 SD = 1.15	*M* = 2.19
Design B	*M* = 2.54 SD = .93	*M* = 2.31 SD = .82	*M* = 2.31 SD = 1.04	*M* = 2.23 SD = .80	*M* = 2.35
Design C	*M* = 3,08 SD = .83	*M* = 3,08 SD = 1.00	*M* = 2.92 SD = 1.07	*M* = 2.92 SD = 1.27	*M* = 3.00
Design D	*M* = 2.92 SD = 1.69	*M* = 3.00 SD = 1.36	*M* = 3.15 SD = .95	*M* = 3.69 SD = 1.49	*M* = 3.19
Design E	*M* = 4.46 SD = 1.08	*M* = 4.49 SD = 1.07	*M* = 4.69 SD = 1.07	*M* = 3.54 SD = 1.65	*M* = 4.30

Table 11. Mean scores horizontal cues

	Strong	Powerful	Intens	Fresh	Total score
Design A	*M* = 2.18 SD = 1.29	*M* = 1.76 SD = 1.06	*M* = 2.41 SD = 1.46	*M* = 3.41 SD = 1.29	*M* = 2.44
Design B	*M* = 2.76 SD = .73	*M* = 3.00 SD = 1.14	*M* = 2.94 SD = .80	*M* = 2.88 SD = .90	*M* = 2.90
Design C	*M* = 2.76 SD = 1.21	*M* = 3.29 SD = .96	*M* = 2.88 SD = 1.37	*M* = 2.65 SD = 1.03	*M* = 2.90
Design D	*M* = 3.29 SD = 1.27	*M* = 2.88 SD = 1.37	*M* = 3.18 SD = 1.29	*M* = 4.12 SD = 1.28	*M* = 3.37
Design E	*M* = 4.00 SD = 1.68	*M* = 4.06 SD = 1.43	*M* = 3.59 SD = 1.72	*M* = 1.94 SD = 1.47	*M* = 3.40

Table 12. Mean scores vertical cues

	Weak	Savorless	Boring	Mild	Total score
Design A	*M* = 3.54 SD = 1.39	*M* = 3.69 SD = 1.32	*M* = 3.31 SD = 1.07	*M* = 2.62 SD = .84	*M* = 3.29
Design B	*M* = 3.46 SD = 1.01	*M* = 3.31 SD = .91	*M* = 3.62 SD = 1.00	*M* = 3.38 SD = 1.00	*M* = 3.44
Design C	*M* = 3.23 SD = .80	*M* = 3.00 SD = 1.04	*M* = 3.54 SD = 1.08	*M* = 3.77 SD = 1.12	*M* = 3.39
Design D	*M* = 2.77 SD = 1.42	*M* = 3.38 SD = 1.27	*M* =2 .92 SD = 1.38	*M* = 3.31 SD = 1.59	*M* = 3.10
Design E	*M* = 2.00 SD = 1.66	*M* = 1.62 SD = 1.44	*M* = 1.62 SD = 1.44	*M* = 1.92 SD = 1.54	*M* = 1.79

Table 13. Mean scores horizontal cues

	Weak	Savorless	Boring	Mild	Total score
Design A	*M* = 3.65 SD = 1.37	*M* = 3.76 SD = 1.52	*M* = 3.35 SD = 1.45	*M* = 2.65 SD = 1.53	*M* = 3.35
Design B	*M* = 3.18 SD = .71	*M* = 3.12 SD = .96	*M* = 3.65 SD = .97	*M* = 3.29 SD = .89	*M* = 3.31
Design C	*M* = 3.06 SD = 1.21	*M* = 2.88 SD = 1.13	*M* = 2.29 SD = 1.18	*M* = 3.59 SD = 1.03	*M* = 2.96
Design D	*M* = 3.41 SD = 1.24	*M* = 3.29 SD = 1.18	*M* = 3.82 SD = 1.25	*M* = 3.29 SD = 1.49	*M* = 3.45
Design E	*M* = 1.71 SD = 1.52	*M* = 1.94 SD = 1.51	*M* = 1.88 SD = 1.45	*M* = 2.18 SD = 1.50	*M* = 1.92

Appendix B. Enquete main study

Introductie:

Beste respondent,

Alvast hartelijk bedankt voor uw deelname aan dit onderzoek. U staat op het punt om mee te doen aan een beoordeling van een nieuwe keelpastille. We zijn benieuwd naar uw mening.

Het onderzoek zal ongeveer 8 minuten van uw tijd in beslag nemen en u mag op ieder moment uw deelname beëindigen. Er zal vertrouwelijk met uw gegevens worden omgegaan en de resultaten worden geheel anoniem verwerkt en alleen gebruikt voor een onderzoek binnen de Universiteit Twente. Indien de onderzoekresultaten gebruikt zullen worden in wetenschappelijke publicaties, dan wel op een andere manier openbaar worden gemaakt, zal dit volledig geanonimiseerd gebeuren.

Mocht u nog vragen hebben dan kunt u contact met mij opnemen via j.c.lansink@student.utwente.nl

Met vriendelijke groet,

Josca Lansink

Q1 Toestemming voor deelname

- ✓ Hierbij ga ik akkoord voor deelname aan het onderzoek

Smaaktest

U bent nu aangekomen bij de smaaktest. Neemt u de verpakking in de hand en bekijk deze. Neem een keelpastille uit de verpakking en proef de smaak van het snoepje. Geef uzelf de tijd om de smaak te ervaren en ga vervolgens door naar het volgende onderdeel van de enquête om uw mening te geven. (Dit mag met de keelpastille nog in uw mond).

- ➔ Geef uw mening

Q2 Welk nummer staat er aan de onderkant van het doosje?

- o 1
- o 2
- o 3
- o 4
- o 5
- o 6

Smaakintensiteit

Q3 Kunt u aangeven in hoeverre u de volgende eigenschappen vindt passen bij de smaak van de keelpastille?

	Helemaal mee oneens	Oneens	Beetje mee oneens	Neutraal	Beetje mee eens	Eens	Helemaal mee eens
Sterk	o	o	o	o	o	o	o
Krachtig	o	o	o	o	o	o	o
Zwak	o	o	o	o	o	o	o
Intens	o	o	o	o	o	o	o
Vlak	o	o	o	o	o	o	o
Verfrissend	o	o	o	o	o	o	o

Smaak liking

Q4 Geef ook bij de volgende statements aan in hoeverre u ze vindt passen bij Q's keelpastilles

	Helemaal mee oneens	Oneens	Beetje mee oneens	Neutraal	Beetje mee eens	Eens	Helemaal mee eens
Ik vind de smaak van de keelpastille lekker	o	o	o	o	o	(	(
De smaak van de keelpastille is onprettig	o	o	o	o	o	o	o

Ik geniet van de smaak van de keelpastille	o	o	o	o	o	o	o
De keelpastille geeft een aangenaam gevoel	o	o	o	o	o	o	o

Smaak complexiteit

Q5 In hoeverre bent u het eens met onderstaande stellingen:

	Helemaal mee oneens	Oneens	Beetje mee oneens	Neutraal	Beetje mee eens	Eens	Helemaal mee eens
De smaak van de keelpastille is complex	o	o	o	o	o	o	o
De keelpastille heeft een rijke smaak	o	o	o	o	o	o	o
De smaak van de keelpastille is gebalanceerd	o	o	o	o	o	o	o

Aantrekkelijkheid van de verpakking

Q6 Bekijk de verpakking en beantwoord onderstaande stellingen

	Helemaal mee oneens	Oneens	Beetje mee oneens	Neutraal	Beetje mee eens	Eens	Helemaal mee eens
Ik vind de verpakking aantrekkelijk	o	o	o	o	o	o	o
De verpakking is verleidelijk	o	o	o	o	o	o	o
De verpakking ziet er goed uit	o	o	o	o	o	o	o

Intentie tot aankoop

Q7 Geef aan in hoeverre u het eens bent met onderstaande stellingen:

	Helemaal mee oneens	Oneens	Beetje mee oneens	Neutraal	Beetje mee eens	Eens	Helemaal mee eens
Ik zou overwegen om de keelpastille te kopen in de supermarkt	O	O	O	O	O	O	O
Ik zou de keelpastille aanbevelen aan mijn vrienden	O	O	O	O	O	O	O
Ik zou graag een proef-verpakking willen ontvangen	O	O	O	O	O	O	O

Manipulatie check

Q8. In welke richting liepen de strepen op de verpakking?

- o Horizontaal
- o Verticaal
- o Neutraal

Q9 Hoe zag het formaat van de verpakking eruit?

- o Liggend
- o Staand
- o Vierkant

Demografische informatie

Q10 Wat is uw geslacht?

- o Man
- o Vrouw

Q11 Wat is uw leeftijd?

- o 25 jaar of jonger
- o 26 – 35 jaar
- o 36 – 45 jaar
- o 46 – 55 jaar
- o 56 – 66 jaar
- o Ouder dan 65 jaar

Q12 Wat is uw hoogst behaalde opleiding?

Indien u bezig bent met een opleiding, vind dan het opleidingsniveau van uw huidige studie aan.

- o Vmbo
- o Havo
- o Vwo
- o Mbo
- o Hbo
- o Wo
- o Wo-master

Moderator smaakvoorkeur mint

Q13 Geef aan in hoeverre u het eens bent met de onderstaande stellingen:

	Helemaal mee oneens	Oneens	Beetje mee oneens	Neutraal	Beetje mee eens	Eens	Helemaal mee eens
Ik vind de smaak van mint lekker	o	o	o	o	o	o	o
Ik hou van sterke smaken	o	o	o	o	o	o	o
Ik hou van intense smaken	o	o	o	o	o	o	o

Q14 Hoe vaak eet of drinkt u producten met mint smaak? (Voorbeelden: keelpastilles, kauwgom, after eat chocolade, mint thee)

- o Dagelijks
- o Wekelijks
- o Maandelijks
- o Bijna nooit
- o Nooit

Q15 Bent u een vaste roker?

- o Ja
- o Nee

Afsluiting

Heel erg bedankt voor uw deelname! Heeft u zelf nog op- of aanmerkingen? Vul ze hieronder in. Klik vervolgens op >> om de vragenlijst af te ronden.

_____