

# The effect of indulgent and healthy-outcome food labelling of healthy and unhealthy products on student's perception

Kirsten van Dijk

BA International Business Communication  
Radboud University

Eating healthy is an important topic that students should adapt because of the beneficial effects on their body and study results. To see if it is possible to influence students' perception about food products by modifying food package labels an experiment was designed. Dutch students were exposed to healthy and unhealthy food products with neutral (= describing the product without evaluation), indulgent (= using sensory words) and healthy-outcome labels (= stating the health outcomes of consuming). Within the experiment expected tastiness, desirability and purchase intention regarding those products were measured. Furthermore, liking of the product, consumption frequency, hunger level and living situation were considered to see if those factors interacted with the product type (healthy or unhealthy) and labels. The results showed that unhealthy products were expected to be tastier, desired more and people intended to buy those more than healthy products. However, no effect of labelling was found. Furthermore, liking and consumption frequency were shown to affect expected tastiness, desirability and purchase intention. Higher liking or consumption frequency resulted in higher expected tastiness, desirability and purchase intention. Professionals can take advantage of the knowledge that different labels do not have different effects when designing product packages.

**Labelling; food packaging; expected tastiness; desirability; purchase intention**

## Introduction

It is impossible to deny that nowadays people are concerned more and more with living a healthy life. This is seen in all aspects of human life, but especially in eating behaviour. The perceived importance of healthy eating is probably caused by anxiety for the consequences of eating unhealthily. The South Australian Government (SA Health, n.d.) lists some of these consequences, for example being obese, having high blood pressure, experiencing depression or getting cancer.

Although people want to eat healthier, it is difficult to determine what is healthy and what is not. A study with 48 interviews revealed that people have different perceptions about eating healthy or unhealthily (Povey, Conner, Sparks, James & Shepherd, 1998). Some mentioned eating natural foods as being healthy, whereas others stressed the importance of a balanced diet. An example of what is perceived as unhealthy is consuming products with high-fat content or manufactured food. In the second part of the research by Povey et al. (1998) these perceptions were tested using 242 questionnaires. The goal was to see which elements of eating healthy or unhealthily from the first study were considered most important. For healthy eating, consuming vegetables and fruits and having a varied diet were considered most important whereas avoiding or eating meat and avoiding sweets were considered least important. Furthermore, people considered eating high fat, greasy and junk food as being the worst regarding unhealthy eating, whereas avoiding meat, eating traditional English food or foreign food were considered the least bad. This shows that different elements in a diet define its healthiness and that people's opinions on this differ. However, the authors still wrote one definition of what healthy and unhealthy eating is based on all these perceptions:

*“Healthy eating tends to be conceptualized as a balanced and varied diet, consisting of 'healthy' foods, fresh and natural foods, plenty of fruit and vegetables, and food containing vitamins and minerals. On the other hand, unhealthy eating tends to be conceptualized as the consumption of 'junk' food,*

fast food, processed food, food with additives, sweet food, food which is low in nutritional value and as eating too much.” (Povey et al., 1998, p. 181)

This definition will be used further on in this paper to conceptualize healthy and unhealthy eating.

When Povey et al. (1998) compared people’s knowledge about eating behaviour to their actual eating behaviour it appeared that there was a gap between knowledge and reality. This suggests there are barriers to implement a healthy eating pattern. A specific group of people that encounter such barriers are students. They have good knowledge about what a healthy diet is and how they should follow that, however, their food choices are not as healthy as expected based on this knowledge. Two of the barriers are convenience: unhealthy food is easier to acquire than healthy food, and taste preference: the taste of unhealthy food is liked more than the taste of healthy food (Abraham, Noriega & Shin, 2018). Furthermore, Sogari, Velez-Argumedo, Gómez and Mora (2018) proposed that there is a list of factors, divided into three categories, which can be both barriers and enablers for students to eat healthily. At the individual level perception, habits, preferences, activities, food preparation, knowledge, time, pricing and state of mind play a role. Secondly, the university and student life are of influence because of the effect living environment has on people. Lastly, at a social level parental feeding behaviour, diet, friends and media pressure are important factors. The fact that healthy food is seen as less filling and thus provokes unhealthy food choices or overeating (Suher, Raghunathan and Hoyer, 2016) underlines the barrier role of perception. Next to that, people see unhealthy portrayed food as tastier than food portrayed as healthy and therefore enjoy and choose unhealthy food more (Raghunathan, Walker & Hoyer, 2006). Furthermore, Croll, Neumark-Sztainer and Story (2001) saw significant knowledge of healthy eating within adolescents, but they also concluded that a lack of time could be a barrier to translate this into action. Altogether this shows that it is difficult for students to eat healthily.

Students need to eat healthily. In the first place, they should do so to prevent experiencing any of the bad consequences of eating unhealthily. However, a second reason is the effect it has on their study results. Positive nutrition behaviour resulted in higher MAP (math and reading) scores (Edwards, Mauch & Winkelman, 2011). For both

reasons it is important to investigate whether their perception of healthy food can be changed as a first step to adopting a healthier lifestyle. This research, therefore, aims to find out if expected tastiness of a product, the desirability of a product and purchase intention can be influenced positively so that students will start the journey to healthier eating behaviour.

### **Theoretical framework**

The first thing people see when doing groceries are product packages (Kobayashi & Benassi, 2015). Such a package is thus important for their perception about the product and their purchasing behaviour, since first impressions matter.

Two focus groups, one with housewives and one with working women, showed that visual elements on packages play the most important role, but that label information is also important. People increasingly consider this while buying food products (Silayoi & Speece, 2004). It was also shown that visual elements play a more important role in situations where the buyer has little time to make a decision, whereas labels have more importance in high involvement situations where people take the time and energy to make a decision. Furthermore, when people are asked to rate the significance of certain elements on food packaging health and nutrition information are shown to be as important as package quality since they link this to the product quality (Konstantoglou, Folinas & Fotiadis, 2020).

When investigating menus in American restaurants, it was found that healthy food is described less appealingly than unhealthy food and therefore unhealthy food with a more appealing description will probably be chosen more often (Turnwald, Jurafsky, Conner & Crum, 2017). Although menus are not packages, this research also suggests that description plays a role in decision making.

Packages seem to play an important role in decision making and food descriptions on them have a significant function as well. More appealing descriptions of healthy food might affect people to choose and buy those more often. This knowledge opens up new questions in society. It is useful to know, especially for marketers, which kind of descriptions should be used to encourage people to buy a product. Furthermore, it is important to know how people can be guided towards more healthy decisions regarding food consumption since healthy eating is considered important nowadays.

Based on earlier research there are different types of possible labels. In the first place, one could opt for indulgent food labelling. This type of labelling aims to appeal to one's senses, for example by describing the product as tasty. Some studies already provide evidence for the positive effect of indulgent labels. For example, in a university cafeteria, where a specific vegetable was described with a basic, healthy restrictive, healthy positive or indulgent label (e.g., beets vs. lighter-choice beets with no added sugar vs. high-antioxidant beets vs. dynamite chilli and tangy lime-seasoned beets), more people chose to eat vegetables when they were described indulgently, compared to the other descriptions of the same vegetable (Turnwald, Boles & Crum, 2017). Furthermore, such taste-focused labels used in several dining settings increased healthy food choices compared to when health-focused labels were used. Next to that, those labels also made people have a more positive opinion about healthy products (Turnwald & Crum, 2019).

A theory that could help explain the effect of indulgent labelling is the Grounded Cognition Theory of Desire (Papies, Barsalou & Press, 2015). This theory explains that people have representations about food that will be activated by simulations. When seeing a specific food, different associations with this product come to mind, for example, the taste and smell of the food. This simulation will make people want and even crave the product (Papies, Barsalou & Ruzs, 2020). The fact that people who visually simulated a craving they once had, said that taste was the most important trigger for a craving (Tiggeman & Kemps, 2005) supports this theory. It is suggested strongly that healthy food often will not be chosen because it is not described as tasty enough (Turnwald et al., 2017). All these findings underline the importance of using indulgent labels.

Secondly, people could use healthy-outcome descriptions for describing food. Such a description mentions the healthiness of a product and specifically what the results of eating this will be. For example, a label could stress that it will lower one's cholesterol level. People's perception, taste experience and buying behaviour related to a product are affected negatively when it is described using a healthy-outcome label. (Wansink, Park, Sonka & Morganosky, 2000). This is because they expect that healthier food is less tasty (Raghunathan et al., 2006). Besides, several experiments among students that framed food products as healthy or as tasty showed that a healthy-

outcome label makes people feel hungrier and makes them consume more food than an indulgent label would do (Finkelstein & Fishbach, 2010). Since these kinds of labels do not seem to be effective, it is expected that consumers will not buy products with such a label.

### **Current research**

The review of the literature above shows that packaging plays an important role in people's perceptions and behaviour. It affects them what they think about the products and if they want to buy it or not (Kobayashi & Benassi, 2015; Konstantoglou et al., 2020; Silayoi & Speece, 2004). Furthermore, language seems to play an important role. If things are described as healthy, they seem to be less attractive to consumers than when they are described using sensory descriptions (Finkelstein & Fishbach, 2010; Papies et al., 2015; Papies et al., 2020; Raghunathan et al., 2006; Tiggeman & Kemps, 2005; Turnwald et al., 2017; Turnwald & Crum, 2019; Wansink et al., 2015). However, there is little research yet on the effect of different labels on packages. Therefore, the research question addressed in this paper is:

RQ: How does indulgent labelling versus healthy-outcome labelling on food packaging influences students' perceptions of healthy and unhealthy foods?

Student's perception is composed of the expected tastiness of the product, the desirability of the product and their intention to buy it. Purchase intention is chosen because people first need to buy the product before they can consume it and thus plays a role in the process towards healthier eating behaviour. However, it is also interesting to see what the effects of labelling on expected tastiness and desirability are. Based on the Theory of Planned Behavior it is expected that these two factors positively influence purchase intention (Ajzen, 2015). If people have a positive attitude, expected tastiness and desirability towards the product this will positively affect their intended behaviour, purchasing it.

Both healthy and unhealthy products will be used in the investigation. For unhealthy products it is more conventional to use indulgent language than for healthy

products (Turnwald et al., 2017). It is important to find out if this conventionality is of an influence. If people are used to indulgent labels on unhealthy food packages, they are probably less affected when seeing this combination and the same may occur for healthy-outcome labels and healthy products. However, the other way around people are less used to indulgent labels on healthy products and thus this combination might have a greater effect.

Based on earlier research (Finkelstein & Fishbach, 2010; Papies et al., 2020; Raghunathan et al., 2006; Tiggeman & Kemps, 2005; Turnwald et al., 2017; Turnwald & Crum, 2019; Turnwald et al., 2017; Wansink et al., 2000), it is expected that indulgent labelling has a positive effect, a more positive attitude towards healthy products, on students' perception while healthy-outcome labelling has a negative effect, a more negative attitude towards healthy products. Furthermore, the conventionality of different labels for healthy and unhealthy products (Turnwald et al., 2017) expects different effect sizes between healthy and unhealthy products. It is therefore hypothesized that:

- H1: Indulgent labelling, compared to neutral labelling, will increase expected tastiness, desirability and purchase intention. This effect will be greater for healthy products than for unhealthy products.
- H2: Healthy-outcome labelling, compared to neutral labelling, will decrease expected tastiness, desirability and purchase intention. This effect will be greater for unhealthy products than for healthy products.

It is necessary within this study to consider some important factors that might be affecting expected tastiness, desirability and purchase intention as well. In the first place, how much people like the product can affect purchase intention (Bower, Saadat & Whitten, 2003). In other words, if someone highly likes a product the intention to buy that product will be higher than if someone does not like it so much. Based on this knowledge the following hypothesis is formulated:

- H3: If the liking of the product is high, the effect of labelling will be greater.

Furthermore, if people like a product they probably also consume it more often than products they do not like. For this reason, it is important to see if consumption frequency is in any way affecting the effect of labelling as well.

H4: The consumption frequency of a product interacts with the effect of labelling.

Thirdly, the participant's hunger level at the moment of experimenting might affect the results. After an experiment in which participants had to imagine a recent food craving, it was found that taste and visual modality were the most important predictors of the food craving. Although a food craving does not always have a relation to hunger, it is probable that from hunger a food craving arises when seeing the food (visual modality) and thinking about the taste (Tiggeman & Kemps, 2005). Therefore, the following is hypothesized:

H5: If someone's hunger level is high, the effect of indulgent labelling will be greater, and the effect of healthy labelling will be smaller.

Finally, a student's living situation may also affect their perception about a labelled food package. Students that are going to live on their own experience a transition and often need to get adjusted to their new living situation. Mostly they do not copy what they learned when living with their parents but acquire new habits based on new things they learn (Blichfeldt & Gram, 2012). For this reason, they might pay more attention to packaging and product labels because they want to make their own purchase choices and it is therefore hypothesized that:

H6: For students living on their own purchase intention will differ more between indulgent and healthy-outcome labelling, whereas for students living with their parents there will not be a significant difference between both types of labelling

## Methodology

To test the hypotheses and to answer the research question an experiment was conducted. This experiment manipulated food packaging to see how students' perceptions towards the different labels (indulgent, healthy-outcome and neutral) and food products (healthy and unhealthy) were.

### Materials

This study contained two independent variables. The first one is the type of product. Healthy as well as unhealthy food products were considered. These were all solid food products, which can be premade meals, snacks, fruit, vegetables, and products that serve as ingredients for a meal. To assess whether a product should be considered healthy or unhealthy a pre-test was conducted which used students at MBO, HBO and university as participants. Each student filled in a Dutch questionnaire that started with demographic questions and continued with pictures of the different food products, asking the participants to rate these products on their healthiness. For this test, questions were derived from a study by Provencher, Polivy and Herman (2009). For every product, the participant had to answer three questions: 'How healthy is this product for you?' ('Hoe gezond is dit product voor u?'), 'Do you think this product fits with a healthy lifestyle?' ('Denkt u dat dit product in een gezonde levensstijl past?') and 'What effect does this product have on your body?' ('Wat voor effect heeft dit product op uw lichaam?'). Every question came with a 7-point scale, respectively: 'really healthy – really unhealthy' ('heel gezond – heel ongezond'), 'completely appropriate – completely inappropriate' ('geheel passend – geheel onpassend') and 'positive effect – negative effect' ('positief effect – negatief effect'). The reliability of perceived healthiness comprising three items was good:  $\alpha = .94$ . The questionnaire was filled out by 20 participants between 19 and 27 years old ( $M = 21.75$ ,  $SD = 1.74$ ) of whom 7 (35%) were male. Most of them (60%) were university students. The results showed that when manually comparing the means the top three healthy products were rye bread, rice crackers and yoghurt. For unhealthy products pink glazed cake, frikandellen and pizza were found to be the top three. An independent samples t-test showed a significant

difference between rye bread and pink glazed cake with regard to expected healthiness ( $t(38) = 16.12, p < .001$ ); pink glazed cake ( $M = 6.28, SD = 0.83$ ) was rated unhealthier than rye bread ( $M = 2.20, SD = 0.77$ ). Another independent samples t-test showed a significant difference between rice crackers and frikandellen with regard to expected healthiness ( $t(38) = 16.69, p < .001$ ); frikandellen ( $M = 6.25, SD = 0.78$ ) were perceived unhealthier than rice crackers ( $M = 2.23, SD = 0.74$ ). A last independent samples t-test showed a significant difference between yoghurt and pizza with regard to expected healthiness ( $t(38) = 15.58, p < .001$ ); pizza ( $M = 6.13, SD = 0.75$ ) was perceived unhealthier than yoghurt ( $M = 2.48, SD = 0.73$ ). The healthy and unhealthy products thus differed significantly on healthiness from each other and could therefore be used in the main study.

The second independent variable in this study is the type of label on the food package with three levels: neutral, indulgent and healthy-outcome. The neutral label was the control condition, whereas the indulgent and healthy-outcome labels were the experimental conditions. For each product in the study a picture of a neutral package without any (suggestion to the) brand was used to eliminate the probability that people were influenced by a specific brand during the experiment. To reflect the three levels of labelling, the label that describes the product was adjusted, while everything else stayed the same. For each product a neutral label (using neutral words to describe the product), an indulgent label (using sensory words) and a healthy-outcome label (pointing at the results of consuming it) were determined. Using an editing tool, the labels were placed on the packages. To avoid any bias of length of the label, all labels were made the same length between four and seven words. All stimuli that were used can be found in the Appendix.

## **Subjects**

As explained in the introduction, students should eat healthily and thus participants in this study were all students. Only native Dutch students were used to rule out any effect of culture and any effect on the perception of the labels due to Dutch not being someone's mother tongue. In this case, students were defined as people that are actively following courses at Dutch MBO or HBO schools and universities. Additionally, age requirements were set at 18-25 years. People that did not comply with those

requirements were not exposed to the stimuli but were eliminated from the survey after the demographic questions. Participants were found in the researchers' networks. All researchers shared the link with Dutch students they know via WhatsApp, LinkedIn, Facebook, Instagram and/or other media. In the end, 115 participants completed the entire survey of which 24 (20,9%) reported to be male, 87 (75,7%) said to be female, 3 (2,6%) preferred not to state their gender and one (0,9%) stated to be non-binary. All participants were between 18 and 25 years old ( $M = 21.43$ ,  $SD = 1.77$ ) and almost three third (62,6%) are university students.

### **Design**

This study had a 3 x 2 within-subjects design with type of label having three levels (neutral, indulgent, healthy-outcome) and type of product having two levels (healthy and unhealthy). For the healthy products every participant saw one product with a neutral label, another one with an indulgent label and the last one with a healthy-outcome label and the same applied to the unhealthy products. Furthermore, to make sure that they were not biased by seeing all conditions in a row the stimuli were presented in a randomized order.

### **Instruments**

The dependent variables of this study were expected tastiness of the product, desirability of the product and purchase intention and were measured in a Dutch questionnaire. Participants were exposed to the stimuli and had to answer questions for every stimulus. Expected tastiness and desirability were tested using the scales already used by Muñoz-Vilches, Van Trijp and Piqueras-Fiszman (2020), but which were extended with new questions. For tastiness of the product the question 'how tasty is the product?' ('hoe smaakvol is dit product?') and 'how yummy is the product?' ('hoe lekker is dit product?') needed to be answered on a 7-point scale (1 = not tasteful/yummy at all (totaal niet smaakvol/lekker), 7 = very tasty/yummy (erg smaakvol/lekker)). The reliability of 'expected tastiness' comprising two items was good:  $\alpha = .94$ . The questions for the desirability of the product were 'how much would you like to eat the product?' ('hoe graag zou u dit product willen eten?') and 'how much would you like to taste the product?' ('hoe graag zou u dit product willen proeven?') and a 7-point scale was used

again (1 = totally not (helemaal niet graag), 7 = really much (heel graag)). The reliability of 'desirability' comprising two items was good:  $\alpha = .93$ . Finally, for purchase intention the scale used by Zeng (2008) was adopted. The statements 'the next time I am doing groceries I would buy this product' ('ik zou dit product de volgende keer als ik boodschappen doe kopen'), 'if I see this product the next time I'm doing groceries I would buy it' ('als ik dit product de volgende keer dat ik boodschappen doe zie, zal ik het kopen') and 'I would give a social effort to buy this product' ('ik zou er een sociale inspanning voor over hebben om dit product te kopen') needed to be answered on a 7-point scale (1 = totally disagree (helemaal oneens), 7 = totally agree (helemaal mee eens)). Two other statements ('the chance I will buy this product ...' ('de kans dat ik dit product zal kopen ...') and 'my willingness to buy this product is ...' (mijn bereidheid om dit product te kopen is ...')) were also answered on a 7-point scale (1 = really small (heel klein), 7 = really big (heel groot)). The reliability of 'purchase intention' comprising five items was good:  $\alpha = .94$ .

The moderating factors that could influence the outcomes of the experiment were measured as well. Firstly, people's consumption frequency of the product was tested using the question 'how often do you eat this product on average per week?' ('hoe vaak eet u dit product gemiddeld per week?') and a 7-point answer scale. Subsequently how much people like the product was tested. The question 'how much do you like this product' ('hoe erg houdt u van dit product?') was asked with a 7-point scale answer option (1 = not much (totaal niet), 7 = really much (heel erg)). This question was derived from the study by Muñoz-Vilches et al. (2020). Furthermore, people's actual hunger level was measured asking them how many hours ago they ate for the last time. Finally, for the living situation a multiple-choice question asked the participants if they live with their parents, with a partner, live on their own with roommates with whom they share their food, live on their own with roommates but do not share their food, live alone or live in another situation which also could be specified in a text box.

## **Procedure**

After conducting the pre-test as described in the material section, the main study was designed and conducted. A questionnaire was made in Qualtrics which started with information of what was expected of the participant, asking them for informed consent,

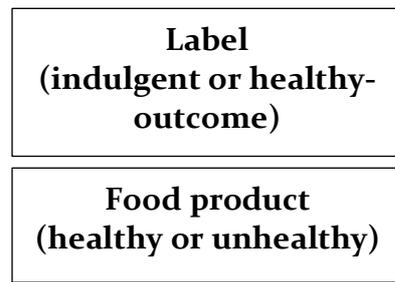
telling them how long it would take and telling where they could get more information. This text did not reveal the real goal of the study. After they had read this text, they were given demographic questions, asking them for their age, gender, educational level and native language. The educational level and mother tongue were important for the research and all cases not corresponding with the target group, not being a student or not having Dutch as their mother tongue, were eliminated. Following, the stimuli were shown one by one with the corresponding questions about the expected tastiness, the desirability of the product, purchase intention, frequency of consuming the product and liking of the product. When participants had finished filling this out, they were asked for their current hunger level and their living situation. These questions were placed after the real experiment to rule out that participants did understand the goal of the research by analysing this question. Filling out this questionnaire took approximately 25 minutes.

### **Statistical treatment**

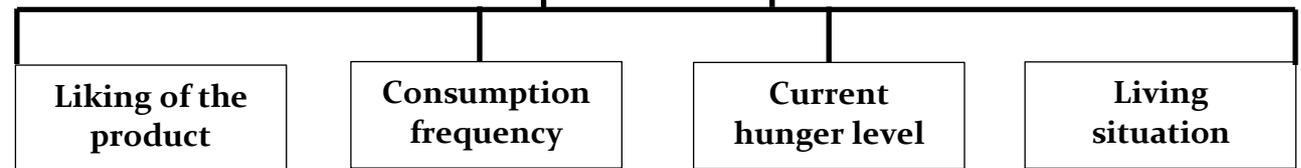
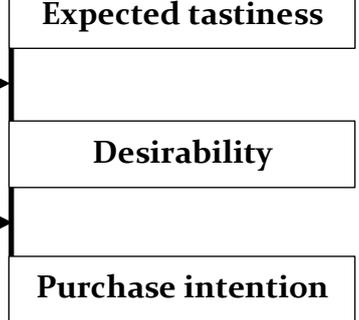
To test the effects and possible interaction of the labels and the product type on the dependent variables three two-way ANOVA's with repeated measures were conducted, one per dependent variable. Furthermore, to see if the moderating factors had a certain influence both ANCOVA's and ANOVA's were used. The first three covariates: how much people liked the product, how often they consume it and how high their hunger level is, ANCOVA's were used to measure their effects. For every covariate three ANCOVA's were used for the different dependent variables. For the last covariate, one's living situation, a mixed ANOVA per dependent variable was used.

## Analytical model

Independent variables



Dependent variables



Moderating factors

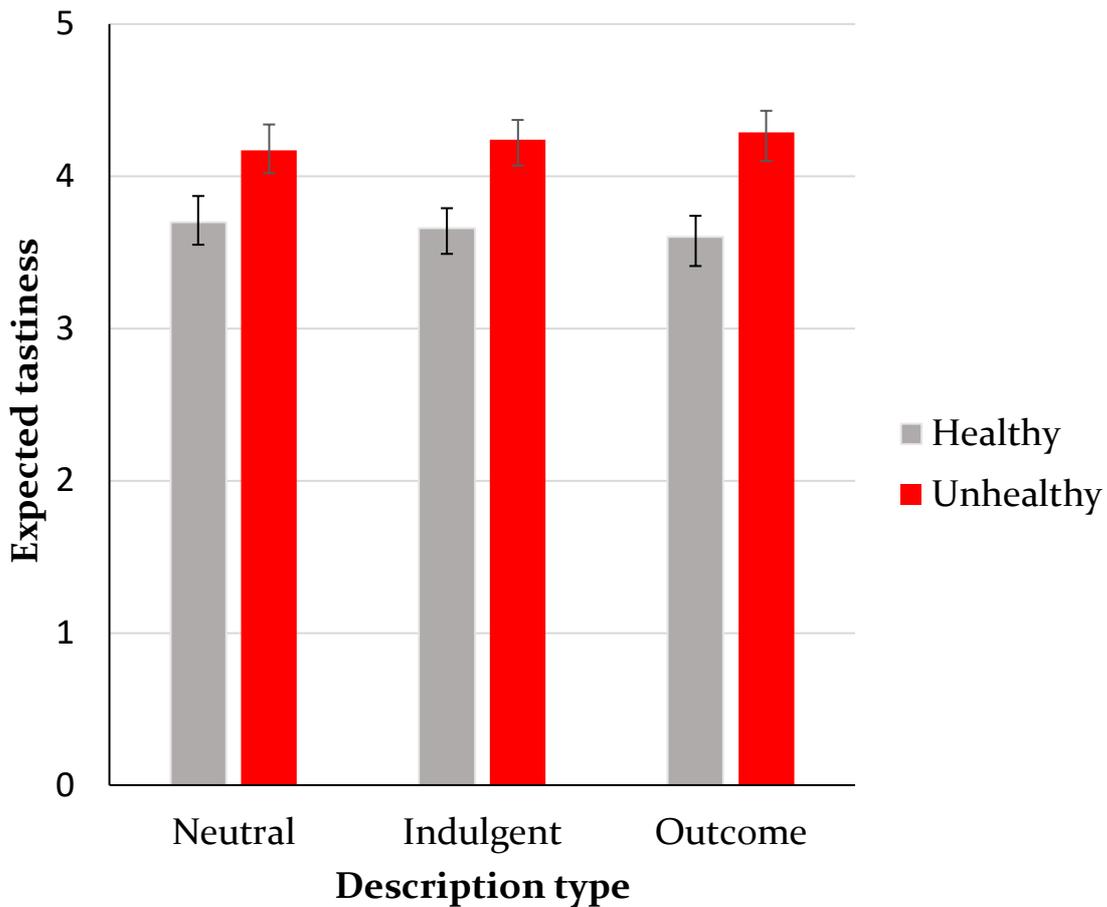
## Results

For all three dependent variables average scores per product type (healthy and unhealthy) and per label (neutral, indulgent and healthy-outcome) were calculated. Furthermore, for every condition (product type x label) average scores were calculated.

### Expected tastiness

A repeated measures analysis for expected tastiness with label and product type as within-subject factors showed a significant main effect of product type ( $F(1, 114) = 42.66$ ,  $p < .001$ ,  $\eta^2 = .272$ ) but no significant main effect of label ( $F(2, 228) = 0.01$ ,  $p = .990$ ,  $\eta^2 = .000$ ) or significant interaction effect of label and product type ( $F(2, 228) = 1.32$ ,  $p = .268$ ,  $\eta^2 = .011$ ). In general, unhealthy products ( $M = 4.60$ ,  $SD = 1.27$ ) were expected to be tastier than healthy products ( $M = 3.68$ ,  $SD = 0.97$ ).

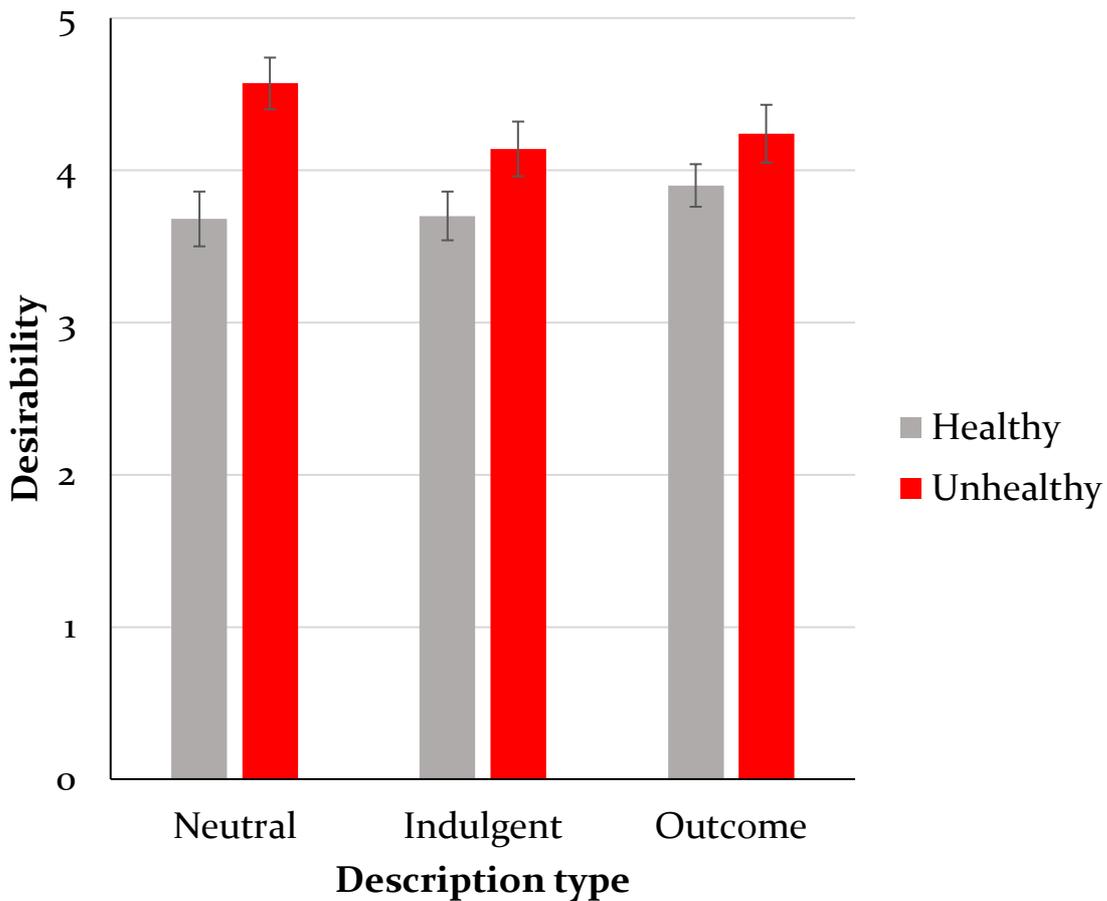
Figure 1. Average mean (and 1 standard error) of expected tastiness



### Desirability

A repeated measures analysis for desirability of the product with label and product type as within-subject factors showed a significant main effect of product type ( $F(1, 114) = 53.09, p < .001, \eta^2 = .318$ ) but no significant main effect of label ( $F(2, 228) = 0.97, p = .382, \eta^2 = .008$ ) or significant interaction effect of label and product type ( $F(2, 228) = 2.83, p = .061, \eta^2 = .024$ ). The results show that unhealthy products ( $M = 4.87, SD = 1.20$ ) were desired more than healthy products ( $M = 3.67, SD = 0.93$ ).

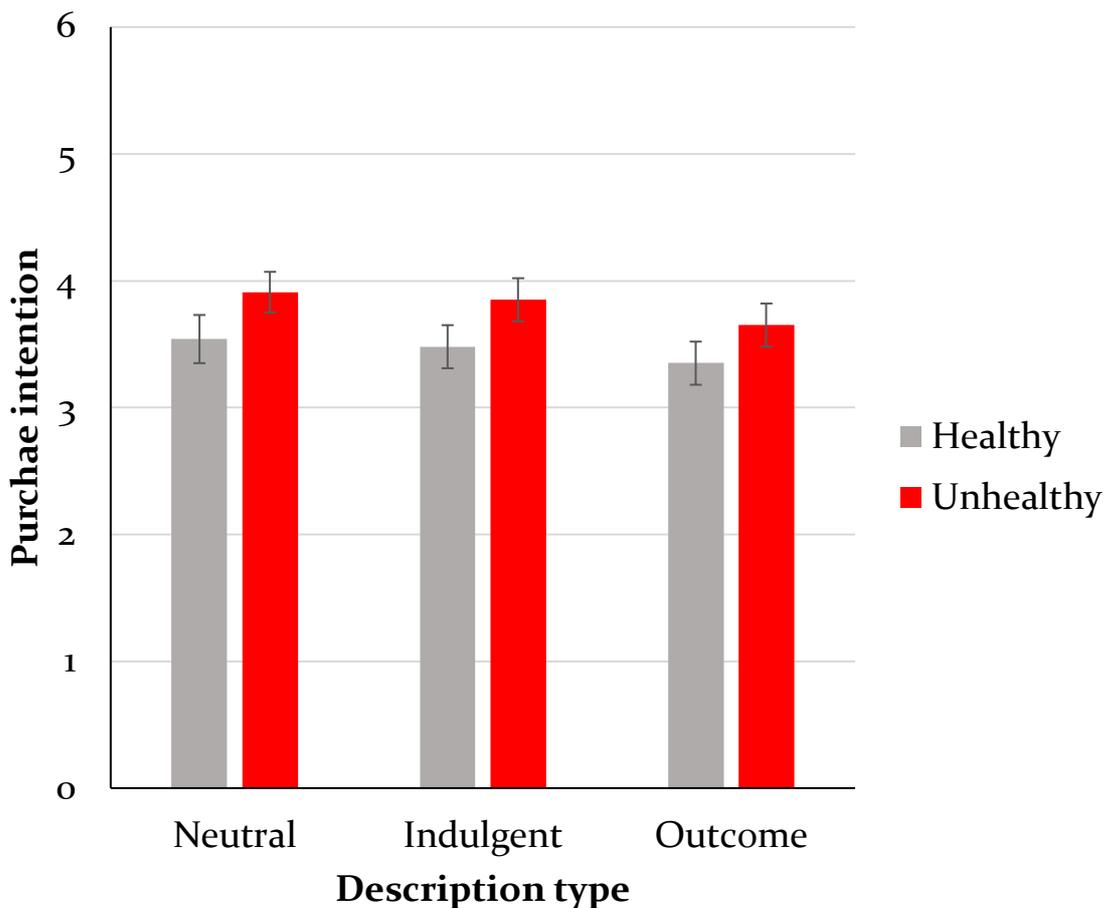
Figure 2. Average mean (and 1 standard error) of desirability



### Purchase intention

A repeated measures analysis for purchase intention with label and product type as within-subject factors showed a significant main effect of product type ( $F(1, 114) = 8.80, p = .004, \eta^2 = .072$ ) but no significant main effect of label ( $F(2, 228) = 0.46, p = .635, \eta^2 = .004$ ) or significant interaction effect of label and product type ( $F(2, 228) = 0.65, p = .524, \eta^2 = .006$ ). Participants had a higher intention to purchase unhealthy products ( $M = 3.54, SD = 1.25$ ) than healthy products ( $M = 3.12, SD = 0.89$ ).

Figure 3. Average mean (and 1 standard error) of desirability



### Moderating factors

The possible effects of the four moderating factors, liking of the product, consumption frequency, current hunger level and living situation, were also tested. For liking of the product and consumption frequency average scores per product were calculated and to be able to perform the tests averages for the dependent variables per product were calculated. Living situation was recategorized in two categories, sharing food in a household (living with parents, partner or roommates) and buying food alone (living alone, living with roommates but not sharing food).

Due to the design of this study, where only 6 products were used, there is too little data for the analyses of liking and consumption frequency to be interpreted with certainty and to draw any conclusions. However, those two were still analysed to be able to come up with some suggestions about the effects.

### *Expected tastiness*

A repeated measures ANCOVA for expected tastiness with label as within-product factor, product type as between-product factor and liking as covariate showed a significant main effect of liking ( $F(1, 3) = 14.42, p = .032, \eta^2 = .828$ ) and a significant interaction effect of product type and liking ( $F(2, 3) = 23.21, p = .015, \eta^2 = .939$ ), but no significant interaction effect of liking and label ( $F(2, 6) = 0.31, p = .748, \eta^2 = .092$ ) or significant three-way interaction of product type, label and liking ( $F(4, 6) = 0.24, p = .906, \eta^2 = .138$ ). A simple regression analysis showed that liking explained 84% of the variance in expected tastiness ( $F(1, 4) = 26.67, p = .007$ ) and was thus shown to be a significant predictor of expected tastiness ( $\beta = .93, p = .007$ ). To follow up the interaction between product type and liking two simple regression analysis were conducted that showed that liking did not explain the variance for expected tastiness of healthy products ( $\beta = .89, p = .301$ ) nor for unhealthy products ( $\beta = .96, p = .177$ ).

Another repeated measures ANCOVA for expected tastiness with label as within-product factor, product type as between-product factor and consumption frequency as covariate showed a significant main effect of consumption frequency ( $F(1, 3) = 18.27, p = .024, \eta^2 = .859$ ) and a significant interaction effect of product type and consumption frequency ( $F(2, 3) = 21.96, p = .016, \eta^2 = .936$ ), but no significant interaction effect of label and consumption frequency ( $F(2, 6) = 0.71, p = .527, \eta^2 = .192$ ) nor a significant three-way interaction ( $F(4, 6) = 0.34, p = .842, \eta^2 = .185$ ). A simple regression analysis showed that consumption frequency did not explain the variance in expected tastiness ( $\beta = .38, p = .452$ ). To follow up the significant interaction two simple regression analyses were conducted and showed that liking did not explain the variance for the expected tastiness of healthy products ( $\beta = .97, p = .147$ ) nor for unhealthy products ( $\beta = .83, p = .378$ ).

A third repeated measures ANCOVA for expected tastiness with label and product type as within-subject factors and hunger level as covariate showed no significant main effect of hunger level ( $p = .999$ ) and no significant interaction effects of label and hunger level ( $p = .171$ ), product type and hunger level ( $p = .123$ ) or label, product type and hunger level ( $p = .659$ ).

A mixed ANOVA for expected tastiness with label and product type as within-subject factors and living situation as between-subjects factor showed no significant

main effect of living situation ( $p = .734$ ), no significant interaction effect of product type and living situation ( $p = .073$ ), no significant interaction effect of label and living situation ( $p = .971$ ) and no significant interaction effect of label, product type and living situation ( $p = .243$ ).

### *Desirability*

A repeated measures ANCOVA for desirability with label as within-product factor, product type as between-product factor and liking as covariate found a significant main effect of liking ( $F(1, 3) = 62.89, p = .004, \eta^2 = .954$ ) and a significant interaction effect of product type and liking ( $F(2, 3) = 58.24, p = .004, \eta^2 = .975$ ), but no significant interaction effect of label and liking ( $F(2, 6) = 0.83, p = .481, \eta^2 = .217$ ) or significant three-way interaction ( $F(2, 3) = 0.93, p = .486, \eta^2 = .382$ ). A simple regression analysis showed that liking explained 96% of the variance in desirability ( $F(1, 4) = 122.64, p < .000$ ) and is thus a significant predictor of desirability ( $\beta = .98, p < .000$ ). To follow up the interaction between product type and liking two simple regressions were conducted which showed that liking explained 99,8% of the variance in desirability of the healthy products ( $F(1, 2) = 948.12, p = .021$ ) and was thus a significant predictor of desirability of healthy products ( $\beta = .99, p = .021$ ), but that liking did not explain the variance in desirability for unhealthy products ( $\beta = .91, p = .269$ ).

Another repeated measures ANCOVA for desirability with label as within-product factor, product type as between-product factor and consumption frequency as covariate found a significant main effect of consumption frequency ( $F(1, 3) = 15.45, p = .029, \eta^2 = .837$ ) and a significant interaction effect of product type and consumption frequency ( $F(2, 3) = 11.91, p = .037, \eta^2 = .888$ ) but no significant interaction effect of label and consumption frequency ( $F(2, 6) = 0.57, p = .594, \eta^2 = .159$ ) nor a significant three-way interaction ( $F(4, 6) = 0.31, p = .862, \eta^2 = .171$ ). A simple regression analysis showed that consumption frequency did not explain the variance in desirability ( $\beta = .50, p = .318$ ). To follow up the significant interaction two simple regression analyses showed that consumption frequency did not explain the variance in desirability for both healthy ( $\beta = .96, p = .174$ ) and unhealthy ( $\beta = .74, p = .470$ ) products.

A third repeated measures ANCOVA for desirability with label and product type as within-subject factors and hunger level as covariate found no significant main effect

of hunger level ( $p = .809$ ) and no significant interaction effects of product type and hunger level ( $p = .844$ ), label and hunger level ( $p = .220$ ) and product type, label and hunger level ( $p = .226$ ).

A mixed ANOVA for desirability with label and product type as within-subject factors and living situation as between-subject factor found no significant main effect of living situation ( $p = .174$ ) and no significant interaction effects of product type and living situation ( $p = .987$ ), label and living situation ( $p = .783$ ) and product type, label and living situation ( $p = .386$ ).

### *Purchase intention*

A repeated measures ANCOVA for purchase intention with label as within-product factor, product type as between-product factor and liking as covariate found a significant main effect of liking ( $F(1, 3) = 96.05, p = .002, \eta^2 = .970$ ) and a significant interaction effect of product type and liking ( $F(2, 3) = 103.54, p = .002, \eta^2 = .986$ ), but no significant interaction effect of label and liking ( $F(2, 6) = 0.57, p = .595, \eta^2 = .159$ ) or significant three-way interaction ( $F(4, 6) = 0.18, p = .939, \eta^2 = .109$ ). A simple regression analysis showed that liking explained 85% of the variance in purchase intention ( $F(1, 4) = 29.18, p = .006$ ) and was thus a significant predictor of purchase intention ( $\beta = .94, p = .006$ ). To follow up the significant interaction two simple regression analyses found that liking explained 99,5% of the variance in purchase intention of the healthy products ( $F(1, 2) = 426.67, p = .031$ ) and was thus a significant predictor of purchase intention of healthy products ( $\beta = .98, p = .031$ ), but that liking did not explain the variance in purchase intention for unhealthy products ( $\beta = .97, p = .158$ ).

Another repeated measures ANCOVA for purchase intention with label as within-product factor, product type as between-product factor and consumption frequency as covariate showed a significant main effect of consumption frequency ( $F(1, 3) = 22.82, p = .017, \eta^2 = .884$ ) and a significant interaction effect of product type and consumption frequency ( $F(2, 3) = 11.07, p = .041, \eta^2 = .881$ ) but no significant interaction effect of label and consumption frequency ( $F(2, 6) = 0.26, p = .777, \eta^2 = .081$ ) nor a significant three-way interaction ( $F(4, 6) = 0.15, p = .954, \eta^2 = .093$ ). A simple regression analysis showed that consumption frequency did not explain the variance in purchase intention ( $\beta = .78, p = .066$ ). To follow up the significant interaction two simple

regression analyses showed that consumption frequency did not explain the variance in purchase intention for healthy products ( $\beta = .96, p = .185$ ) nor for unhealthy products ( $\beta = .85, p = .359$ ).

A third repeated measures ANCOVA for purchase intention with label and product type as within-subject factors and hunger level as covariate found no significant main effect of hunger level ( $p = .230$ ) and no significant interaction effects of product type and hunger level ( $p = .560$ ), label and hunger level ( $p = .811$ ) and product type, label and hunger level ( $p = .099$ ).

A mixed ANOVA for purchase intention with label and product type as within-subject factors and living situation as between-subject factor found no significant main effect of living situation ( $p = .660$ ) and no significant interaction effects of product type and living situation ( $p = .216$ ), label and living situation ( $p = .370$ ) and product type, label and living situation ( $p = .349$ ).

## **Conclusion & discussion**

This research aimed to test the effect of different labels on packages on students' perceptions about healthy and unhealthy products and how perception differed for those two product types. Raghunathan et al. (2006) and Wansink et al. (2000) found that unhealthy products are expected to be tastier than healthy products and that people's intention to buy unhealthy products was higher than the intention to buy healthy products. The current research support this: unhealthy products were expected to be tastier, desired more and the intention to buy those was higher than compared to healthy products.

The different types of labels in the current study did not affect the expected tastiness, desirability of the product or purchase intention. Therefore, the first two hypotheses were rejected. Indulgent labels did not increase the expected tastiness, desirability and purchase intention and healthy-outcome labels did not decrease those. Although earlier research (Finkelstein & Fishbach, 2010; Papies et al., 2020; Raghunathan et al., 2006; Tiggeman & Kemps, 2005; Turnwald et al., 2017; Turnwald & Crum, 2019; Turnwald et al., 2017; Wansink et al., 2000) suggested that indulgent labels

would have a positive effect and healthy-outcome labels would negatively affect how people see different food products, this study did not find these differences. This may be partially due to a limitation in the design of the current study. The healthy-outcome labels were all formulated positively, which means that they pointed at the positive results of consuming a product. However, unhealthy products probably have more negative outcomes when eating it and the positive label might therefore be unrealistic and not affecting people's perceptions. In other words, the external validity of the current study might be weak. Further research should investigate if having positive healthy-outcome labels for healthy products and negative, more realistic, healthy-outcome labels for unhealthy products does affect expected tastiness, desirability and purchase intention more. However, this can only explain the fact that healthy-outcome labels did not affect students' perception and not why there was no effect found for indulgent labels.

Although in the introduction of the study people were asked to read carefully, it could be that participants still did not consider the labels enough when answering the questions. An explanation for this might be that the pictures on the packages were misleading. This can be supported by Housgard, Pytlik and Tzvetkova (2010) who found that people pay the most attention to graphical elements on the packages and that those elements play an important role in how people think about a product. To ensure that people base their answer on the product labels, product pictures could be removed in further research although this is not desirable since it weakens the external validity even more because packages in real life almost always contain pictures. It is a decision that should be made based on the main goal of a study. Related to this, Silayoi and Speece (2004) found that in high involvement situations, where people take the time and energy to make a decision, labels were seen to be important for predicting people's behaviours, but that in low involvement situations, where little time and energy are used, labels were not considered so much. It could be that in the current research the situation was a low involvement situation.

Based on the Grounded Cognition Theory of Desire (Papies et al., 2015) it was expected that the visual simulation of a product would evoke taste experiences in the mind which make people want to have the specific product. Since indulgent labels use sensory, taste-related words it would be logical that they strengthen those experiences

and subsequent cravings. However, this was not seen in this research. It could be that the used stimuli did not function as a visual simulation. Therefore, future research should investigate if packages in some way can make use of this theory to make people crave the products.

The third hypothesis expected, based on research by Bower et al. (2003), that if people liked a product more, the effect of labelling would be larger. Unfortunately, this study, probably because of little data, was not able to confirm this. However, this study did find that liking had a main effect on expected tastiness, desirability and purchase intention. If people liked a product more, the expected tastiness, desirability and purchase intention were higher than when they liked a product less. Whereas Bower et al. (2003) only found that certain labels on products are more effective when combined with high liking, the current research found that such a high liking is also effective on its own. Since there was little data, conclusions cannot be drawn, but it can be suggested that liking plays a role in people's perception and behaviour. For future research needs to compare the effects of liking on its own and as a factor that interacts with the labels. This because if those effects do not differ significantly this means that in practice liking is not something to take into consideration. It would be something that occurs always, and its influence is not significantly important. However, if the effects would differ significantly those effects need to be kept in mind when designing packages.

For the fourth hypothesis, higher consumption frequency would influence the effect of labelling, the same as which occurred with liking. This hypothesis also could not be confirmed. However, consumption frequency seemed to affect students' perceptions. Again, data was little and therefore it is difficult to conclude anything, but the results suggest that when people consume a specific product more often, they will expect it to be tastier, will desire it more and intend to purchase it more, than when they consume it less frequently. How this interaction differs between healthy and unhealthy products should be investigated in the future with more data.

The last two hypotheses both need to be rejected as well. Although it was expected that hunger level, which ranged from not having eaten for 0 hours to 18 hours, and living situation, which was divided into 64% sharing a household (N = 73) and 36% living alone (N = 41), would influence labelling, this was not found in this research. This could mean that hunger level does not evoke the food craving as expected based on

research by Tiggeman and Kemps (2005). Furthermore, although students change behaviour when living on their own (Blichfeldt & Gram, 2012) in the current study they did not show to have other perceptions than people that live with other people.

This research among students did not find evidence that different labels had a different effect on their perception of specific food products. Since this was the first study to see what the effect of different labels on packages is, it could be the first evidence that using indulgent or healthy-outcome labels on packages have no effect. For future research it is useful to see what other strategies regarding labels are possible and if those are effective.

This study, just as most of the earlier research (Finkelstein & Fishbach, 2010; Tiggeman & Kemps, 2005; Turnwald et al., 2017; Turnwald & Crum, 2019; Wansink et al., 2000), used students as participants. It is therefore unlikely that it is because of the type of participants that the hypotheses needed to be rejected. However, it is still necessary to study other participant groups to see how their perception is and if it could be affected somehow because in society all people are interesting and not only students.

For professionals the results of this study can be very interesting and helpful. Putting indulgent or healthy-outcome labels on their product will not lead to the expected results formulated in this research. On the other hand, this study again showed that liking and consumption frequency are seen to be predictors of students' behaviour and thus cannot be ignored by marketers. They should acknowledge this and use it in their professional life.

## **Bibliography**

- Abraham, S., R. Noriega, B., & Shin, J. Y. (2018). College students eating habits and knowledge of nutritional requirements. *Journal of Nutrition and Human Health*, 02(01), 13–17. <https://doi.org/10.35841/nutrition-human-health.2.1.13-17>
- Ajzen, I. (2015). Consumer attitudes and behavior: The theory of planned behavior applied to food consumption decisions. *Rivista Di Economia Agraria*, LXX(2), 121–138. <https://doi.org/10.13128/REA-18003>

- Blichfeldt, B. S., & Gram, M. (2012). Lost in transition? Student food consumption. *Higher Education*, 65(3), 277–289. <https://doi.org/10.1007/s10734-012-9543-2>
- Bower, J. A., Saadat, M. A., & Whitten, C. (2003b). Effect of liking, information and consumer characteristics on purchase intention and willingness to pay more for a fat spread with a proven health benefit. *Food Quality and Preference*, 14(1), 65–74. [https://doi.org/10.1016/s0950-3293\(02\)00019-8](https://doi.org/10.1016/s0950-3293(02)00019-8)
- Croll, J. K., Neumark-Sztainer, D., & Story, M. (2001). Healthy eating: What does it mean to adolescents? *Journal of Nutrition Education*, 33(4), 193–198. [https://doi.org/10.1016/s1499-4046\(06\)60031-6](https://doi.org/10.1016/s1499-4046(06)60031-6)
- Edwards, J. U., Mauch, L., & Winkelman, M. R. (2011). Relationship of nutrition and physical activity behaviors and fitness measures to academic performance for sixth graders in a Midwest city school district. *Journal of School Health*, 81(2), 65–73. <https://doi.org/10.1111/j.1746-1561.2010.00562.x>
- Finkelstein, S. R., & Fishbach, A. (2010). When healthy food makes you hungry. *Journal of Consumer Research*, 37(3), 357–367. <https://doi.org/10.1086/652248>
- Housgard, L., Pytlik, A. & Tzvetkova, P. (2010). How packaging attributes affect purchase decisions: an exploratory study of modern consumers. (Unpublished master's thesis). Lund University, Sweden.
- Kobayashi, M. L., & Benassi, M. T. (2015). Impact of packaging characteristics on consumer purchase intention: Instant coffee in refill packs and glass jars. *Journal of Sensory Studies*, 30(3), 169–180. <https://doi.org/10.1111/joss.12142>
- Konstantoglou, A., Folinas, D., & Fotiadis, T. (2020). Investigating food packaging elements from a consumer's perspective. *Foods*, 9(8), 1097. <https://doi.org/10.3390/foods9081097>
- Muñoz-Vilches, N. C., van Trijp, H. C. M., & Piqueras-Fiszman, B. (2020). Tell me what you imagine and I will tell you what you want: The effects of mental simulation

- on desire and food choice. *Food Quality and Preference*, 83. <https://doi.org/10.1016/j.foodqual.2020.103892>
- Papies, E. K., Barsalou, L. W., & Press, G. (2015). Grounding desire and motivated behavior: A theoretical framework and review of empirical evidence. *The psychology of desire*, 36-60.
- Papies, E. K., Barsalou, L. W., & Rusz, D. (2020). Understanding desire for food and drink: A grounded-cognition approach. *Current Directions in Psychological Science*, 29(2), 193-198. <https://doi.org/10.1177/0963721420904958>
- Povey, R., Conner, M., Sparks, P., James, R., & Shepherd, R. (1998). Interpretations of healthy and unhealthy eating, and implications for dietary change. *Health Education Research*, 13(2), 171-183. <https://doi.org/10.1093/her/13.2.171>
- Provencher, V., Polivy, J., & Herman, C. P. (2009b). Perceived healthiness of food. If it's healthy, you can eat more! *Appetite*, 52(2), 340-344. <https://doi.org/10.1016/j.appet.2008.11.005>
- Raghunathan, R., Naylor, R. W., & Hoyer, W. D. (2006). The unhealthy = tasty intuition and its effects on taste inferences, enjoyment, and choice of food products. *Journal of Marketing*, 70(4), 170-184. <https://doi.org/10.1509/jmkg.70.4.170>
- Rao, M., Afshin, A., Singh, G., & Mozaffarian, D. (2013). Do healthier foods and diet patterns cost more than less healthy options? A systematic review and meta-analysis. *BMJ Open*, 3(12), e004277. <https://doi.org/10.1136/bmjopen-2013-004277>
- SA Health. (n.d.). The risks of poor nutrition | SA Health. Retrieved October 15, 2020, from <https://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/healthy+living/is+your+health+at+risk/the+risks+of+poor+nutrition>
- Silayoi, P., & Speece, M. (2004). Packaging and purchase decisions. *British Food Journal*, 106(8), 607-628. <https://doi.org/10.1108/00070700410553602>

- Sogari, G., Velez-Argumedo, C., Gómez, M., & Mora, C. (2018). College students and eating habits: A study using an ecological model for healthy behavior. *Nutrients*, *10*(12), 1823. <https://doi.org/10.3390/nu10121823>
- Suher, J., Raghunathan, R., & Hoyer, W. D. (2016). Eating healthy or feeling empty? How the “healthy = less filling” intuition influences satiety. *Journal of the Association for Consumer Research*, *1*(1), 26–40. <https://doi.org/10.1086/684393>
- Tiggemann, M., & Kempers, E. (2005). The phenomenology of food cravings: The role of mental imagery. *Appetite*, *45*(3), 305–313. <https://doi.org/10.1016/j.appet.2005.06.004>
- Turnwald, B. P., Boles, D. Z., & Crum, A. J. (2017). Association between indulgent descriptions and vegetable consumption: Twisted carrots and dynamite beets. *JAMA Internal Medicine*, *177*(8), 1216–1218. <https://doi.org/10.1001/jamainternmed.2017.1637>
- Turnwald, B. P., & Crum, A. J. (2019). Smart food policy for healthy food labeling: Leading with taste, not healthiness, to shift consumption and enjoyment of healthy foods. *Preventive Medicine*, *119*, 7–13. <https://doi.org/10.1016/j.ypmed.2018.11.021>
- Turnwald, B. P., Jurafsky, D., Conner, A., & Crum, A. J. (2017). Reading between the menu lines: Are restaurants’ descriptions of “healthy” foods unappealing? *Health Psychology*, *36*(11), 1034–1037. <https://doi.org/10.1037/hea0000501>
- Wansink, B., Park, S. B., Sonka, S., & Morganosky, M. (2000). How soy labeling influences preference and taste. *The International Food and Agribusiness Management Review*, *3*(1), 85–94. [https://doi.org/10.1016/S1096-7508\(00\)00031-8](https://doi.org/10.1016/S1096-7508(00)00031-8)
- Zeng, Y. (2008). *Young consumers’ perceptions and purchase intentions towards mass-designer lines*. (Unpublished masters’ thesis). Iowa State University, Ames, Iowa.

## Appendix

All stimuli of this research are shown below. For every product three pictures represent the three labels in this order: neutral label, indulgent label, healthy-outcome label.

### Rye bread



## Rice crackers



# Yogurt



## Pink glazed cake



## Frikandellen

### Frikandellen

Snack van verschillende soorten vlees



### Frikandellen

Verrukkelijke warme snack uit de frituur



### Frikandellen

Geeft je kort een vol gevoel



## Pizza

