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# TARGETING A HEALTHIER CHOICE

The influence of a decoy in a choice set consisting of a  
healthier and an unhealthy snack.

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## Abstract

Objective: To investigate whether the addition of a decoy in a choice set can steer people to choose for the healthier option. Method: In this within-subject experiment, 118 participants were randomly assigned to either the original choice set consisting of the target and the competitor option, or the decoy set that, besides the items from the first condition, also included the decoy option. Results: Independent Sample T-Test showed that scores for attractiveness of target differed marginally significant between the two conditions;  $t(116) = -1.89$ ,  $p = 0.06$ , with condition 1 (original set) ( $M = 4.87$ ,  $SD = 1.95$ ) and condition 2 (decoy set) ( $M = 5.57$ ,  $SD = 2.05$ ). Results of the Chi-Square test showed that choice for target was found not to be significantly different between the two conditions,  $\chi^2(1) = .669$ ,  $p > .05$ . Conclusions: The addition of a decoy in the choice set seems to lead to a better evaluation of the target option, however this effect was not strong enough to assume that the decoy would lead to a change in choice for the healthier option.

*Keywords: decoy, asymmetric dominance, choice architecture*

## 1. Introduction

One of the major problems that the contemporary society faces, is that a growing number of people is suffering from obesity (Williams et al., 2015). Worldwide, more than 2.1 billion people are considered overweight or obese. This is stated to be the fifth leading cause of death in the world, accounting for nearly 3.4 million deaths annually (Smith & Smith, 2016). Obesity is the result of individuals consuming more energy than they are expending. Although this is the most commonly mentioned cause, obesity is highly complex and includes genetic, psychological, economic, social, environmental and even political factors that interact in varying degrees to stimulate the development of obesity (Wright & Aronne, 2012). Several researchers have investigated the determinants of obesity, which resulted in broad range of different causes. For example, Rolls (2003) emphasizes the contribution of environmental factors such as portion size, to the epidemic of obesity. Keith et al., (2006) came up with ten additional explanatory factors for obesity such as lack of sleep and use of medication. Bray & Champagne (2005) consider both genetic factors and the food industry as huge influencing factors for obesity.

A main characteristic for the contemporary food industry is the widespread availability of appetizing products that makes it challenging to resist the temptation of consuming these foods (Lowe et al., 2009). In a study of Brownell & Horgen (2004) about insides of the food industry it was said that for a long time in human history, the primary reason for seeking food was to stay energized and to avoid starvation. In modern times however, many of our food consumption takes place because of other reasons than the reason of need for energy. Due to an increase in prevalence of obesity, it is suggested that an increasing proportion of food consumption is driven by pleasure instead of a simple need for energy (Lowe & Butryn, 2007). An increase in availability of foods goes together with an increase of variety of the offered products. It is found that an increase in variety of food increases the consumption volume of that food (Miller et al., 2000; Rolls, 1986). These studies also suggest that even if the actual variety of the assortment is not increased, changing the structure of an assortment can increase how much is consumed (Wansink, 2004).

It is thus seen that not only availability is of big influence on consumer behavior, but that the structure of an assortment plays an important role on the decision making process as well. For many stores the assortment is structured according to a well thought out design. This is related to choice architecture, which is the environment within which people make choices and adheres the idea that behavior can be influenced by altering these environments (Hollands et al., 2013). Several studies upon this topic have been done. The review of positional influences on food choice of Bucher et al. (2016) for example,

has identified that manipulation of food product order or proximity can influence food choice. Other research has suggested that product assortment does not only play a key role in satisfying wants, but that it can also influence buyer wants and preferences (Simonson, 1999; Hart & Rafiq, 2006).

These findings point out the limitations of rationality in human decision making, which may result in suboptimal choices being made by an individual. Deviations of rational decision making are often described as heuristics or biases. One example of such a deviation is the 'status quo bias', which means that people tend to like things to stay relatively the same. Considering these limitations, it is of great importance to understand how behavior can be altered in order to steer decisions into the right direction. A term that is often used for this is 'nudge', which is defined as "an approach to behavioural change that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives" (Li & Chen, 2019). Nudges thus provide solutions to problems that originate from limitations in human decision making (Loewenstein & Chater, 2017). When nudges are used by either private or public institutions to steer people in a direction that will promote their own welfare, we speak of libertarian paternalism (Thaler & Sunstein, 2003). Knowledge upon this topic is being applied in several ways in order to steer people to healthier decisions (Kongsbak et al., 2016). Considering the status quo bias, the use of defaults can be very effective. For example when aiming for an increase of organ donors, the default was switched from not being an organ donor to being an organ donor. Through this new 'opt-out' system, in which people initially were organ donors but had to register themselves as not an organ donor if they refused, the level of organ donor in total heavily increased (Li et al., 2013).

The tendency for people to make different decisions depending on how options that are objectively the same are presented or "framed" is called the framing effect (Strough et al., 2011). One example for this is the addition of a product, that is inferior to one of the other options, into the choice context when the decision is to be made between two equally attractive options (Huber et al., 1982). Such an inferior option is also referred to in the literature as a decoy. The study of Li et al., (2019) investigated whether the addition of a decoy could steer employees in food-processing factories to use sanitizer. To do so, they conducted a longitudinal field experiment of 40 days in which they tested two decoy sanitation options that were worse than the existing sanitizer spray bottle. Results showed that the presence of a decoy drastically increased food workers' hand sanitizer use from the original sanitizer bottle and, consequently, improved workers' passing rate in hand sanitation tests from 60% to 70% to above 90% for 20 days. Other research by Huber et al. (1982) has been done to the effect of adding a decoy in the following product categories; cars, restaurants, televisions and lotteries. The addition of the decoy appeared to have a strong effect upon the choice for the dominating option (Huber et al.,

1982). These findings indicate that the decoy effect can be a powerful nudge technique to influence real behavior.

Yet, it is unknown whether the decoy effect can be used as a nudge to steer consumers towards healthier choices. Only one study examined the decoy effect with food products. Carroll & Vallen (2014) investigated the effect of a decoy in a choice context consisting of salad bags. In their experiment two conditions were designed and participants were randomly assigned to one of those conditions. The first condition contained two options and the second condition contained the same option but a decoy item was added. Participants were asked to choose an item based on the information they received about the caloric value and price. Because this was all the information that participants had received, the importance of the caloric value might have weighted heavier in this experiment than it would have in a real life setting. This is expected because in a real life setting the caloric value would not be so emphasised that besides price, this is the only thing the customer knows. Therefore, Carroll & Vallen (2014) suggested to explore this effect in future research considering the boundary conditions of calorie context effects.

In the current study, a decoy will be added to a small assortment of snacks to understand its effect on consumer snack choices. Considering the suggestion of Carroll & Vallen (2014), the items in this study will differ on the attributes 'healthiness' and 'taste'. This will be measured through a small pilot study beforehand, according to how these attributes are perceived by the respondents. This implies that participants will not be actively pointed out to the caloric value in order to prevent an unrealistic choice setting with an unrealistic choice as a possible result. Since it is argued that nudges can be helpful to steer people's behavior into the right direction, it will be investigated if a decoy can help people to choose the healthier option. This will be done through both a choice experiment and a real life experiment.

The main question that will be answered in this research is:

*Q1: 'What is the effect on choice for the target option when a third item (decoy) is added into a choice set consisting of an unhealthy (competitor) and a healthier (target) snack?'*

This will be investigated through the following two sub questions:

*SQ1: What is the effect on attractiveness of the target option when a decoy is added in a choice set consisting of an unhealthy and a healthier snack?*

*SQ2: What effect does the attractiveness of the target have on the choice for the target?*

## 2. Theoretical framework

Making use of choice models is an important tool for marketers to understand how the introduction of a new brand or product into the market is received. Two assumptions that the standard model of choice from Luce (2012) generates, are the assumption of proportionality and the assumption of regularity. The assumption of proportionality assumes that a new offering will take share from other products in proportion to their original share. However, there is consensus among researchers that new products take disproportionately more share from products that appear similar to it than from those that are dissimilar. This phenomenon is referred to as the similarity hypothesis and is also based on rational decision making. The regularity principle assumes that the addition of a new alternative cannot increase the probability of choosing a member of the original set (Huber et al., 1982). This choice model thus assumes that people are rational decision makers. However, when people are being nudged they do not act according to the rational decision making rules, due to their actions being steered through small interventions. This deficit of rational decision making capabilities in the human brain, is related to multiple factors. Irrational decision making especially occurs when it is too complicated to assess all the information before deciding what to choose. Therefore, people use rules of thumb, which are also called heuristics, to reduce the effort that has to be made to come to the optimal choice. Strategies that are being applied are for example that fewer attributes are being evaluated, the weighting of attributes is being simplified, less information is being integrated or fewer alternatives are being examined (Gigerenzer & Gaissmaier, 2011).

### 2.1 Adding a decoy

Imagine an original set consisting of two equally attractive options: the target and the competitor. When an asymmetric dominated alternative is added to the choice set, the attractiveness of the target increases. The addition of an asymmetric dominated alternative, also referred to as decoy, violates both of the assumptions mentioned above. An alternative is “asymmetric” if it is dominated by one item in the set, but not dominated by the other one. In the research of Huber et al., (1982) it is shown that the addition of the decoy increases the share of the item that dominates it, which is referred to as the target. This mechanism violates the assumption of regularity. Furthermore, since the decoy is typically closest to the target, this result implies that the addition of this third item to the set “helps” the item that is the most similar, which is inconsistent with the similarity hypothesis.

For example, consider two options: option A, a modestly effective oral medication, and option B, a highly effective injectable. Both options are dominant on one attribute. Option A dominates on the method of administration and option B dominates on efficacy, so a trade-off has to be made. However

both options can be considered as equally attractive. The decoy effect entails offering a third option, option C; this could be an injectable with an efficacy somewhere in between the options A and B. Considering the new choice set, it remains difficult to tell whether the decoy is better or worse than option A. This is because the desired trade-off is to be made between two different attributes: efficacy or method of administration. This is different for the decoy and option B: they both require the same method of administration, but option B has a higher efficacy than the decoy. Therefore, even though the decoy would not be expected to ever be chosen (as it is clearly less desirable than option B), its presence is repeatedly proven to influence the way in which choices are being made between the remaining two options (Whitman et al., 2019).

The decoy effect, also referred to as the attraction effect, has been replicated in several studies with a wide variety of product categories and choice sets. Hedgcock & Rao (2009) investigated the effect of a decoy in a choice set that consisted of two houses that differed on the attributes of price and crime rates in the area where the house was located. The target option had higher crime rates in its area, but was lower in price. The competitor had lower crime rates, but was higher in price. The third item that was added to the set, had the same crime rate as the target, but was somewhere in between the target and the competitor regarding price. Examining the choice shares of both conditions, they found that when an option was decoyed, its share increased by approximately 20% on average. Another choice context in which the effect of a decoy was investigated, was in the choice for a holiday package. The experiment was executed with two choice sets consisting of holiday packages for either Las Vegas or Disney World. Both sets contained a target, a competitor and a decoy. The target option was more expensive and was of higher value than the competitor. When the decoy was added to the choice set, the extra option that was provided had the same value as the target, but was higher in price. It was found that the addition of the decoy to the choice set, resulted in a predominant shift of customers' preference towards the higher priced packages, regardless of the package that was offered. This shows that the addition of a third inferior option can lead to a shift in consumer's decisions (Josiam and Hobson, 1995).

As can be seen from the section above, many of those studies investigate the attraction effect with products that are being evaluated on two dimensions. However, Ariely & Wallsten (1995) investigated the attraction effect between products that were evaluated on three dimensions. In their research they had a target and a competitor that were both dominant on one dimension as well. However, the decoy scored slightly better than the target on the two other dimensions (110% for a positive dimension and 90% for a negative dimension). Nevertheless, for the third dimension it applied that the decoy scored a lot worse than the target (140 or 150% for a negative dimension and 40% or 50% for a

positive dimension). The aim was to create a preference relation between the target and the decoy in which the third dimension was strongly better in the target item, but on the other two items slightly less preferred. In the current research the effect of a decoy will be examined in a choice set that consists of two snacks that are both strong on one attribute. The target option excels in the attribute 'healthiness', while the competitor exhibits strength regarding the attribute 'taste'. The decoy will be inferior to the target. To ascertain that the decoy was perceived as less attractive, a small pilot study was performed beforehand. Since the decoy is said to lead to a change in behavior, the hypothesis regarding the main question of this research is as follows:

*H1(Q1): The addition of a decoy in the choice set will lead to an increase of share for the target.*

## 2.2 Explanation of the attraction effect

As said before, "The attraction effect refers to an inferior product its ability to increase the attractiveness of another alternative when the inferior product is added to a choice set" (Ratneshwar et al., 1987, p. 520).

Several possible explanations for the appearance of the attraction effect are existing in the literature. Huber et al., (1982) suggested the idea of a range effect. This idea implies that the addition of a decoy to the choice set narrows the category judgement for the weak attribute. To demonstrate this we take the example described in section 2.1 about the choice for medication. In the original choice set both of the options are weak on one attribute: option A has a lower efficacy and option B has a poor method of administration. The third option that is added to the choice set has the same method of administration as item B, resulting in two items in the choice set that perform weakly on the attribute of method of administration. The extension of choice in this less favourable dimension may result in a decrease of the target's (option B) deficit on that dimension. This same mechanism was also found by Huber & Puto (1983) to work adversely. They argued that the addition of a decoy might result in this decoy being used as an anchor. According to this theory, the anchor was being used to make a comparison between based on the "local" superiority of the target rather than the competitor. Again, we take the example of the example about the medication. Both options A and B are performing strongly on one attribute: option A has a better method of administration and option B has a higher efficacy. When the decoy option C is added, the choice set contains two options with a high efficacy but the decoy performs slightly worse on this dimension. According to this theory, the extension of choice in this more favourable dimension may result in this dimension serving as anchor in the choice that is to be made. Summarised, the latter argumentation takes the strong attribute as starting point



for evaluation while the range effect takes the influence on the weak attribute as starting point to explain the attraction effect.

Regardless of the explanation for this effect, the mechanism underlying the attraction effect assumes that an inferior product causes an increase of the attractiveness of the dominant alternative when it is added to the choice set. Therefore, the second hypothesis of this research is:

*H2(SQ1): When the decoy that is inferior to the healthier option, is added to the choice set consisting of an unhealthy (competitor) and a healthier (target) snack, the attractiveness of the healthy option increases.*

When the attractiveness of the target is increased by the addition of a decoy, it can be expected that the choice for the target increases as well. Namely, the attractiveness of a product is of great influence on the decision for consumers to buy the product or not (Chan et al., 2010). Therefore the third hypothesis of this research is:

*H3(SQ2): The more positive the attractiveness of the target is evaluated, the higher the chance the target option will be chosen.*

All hypotheses of this research are visualised in the conceptual framework in Figure 1 below.

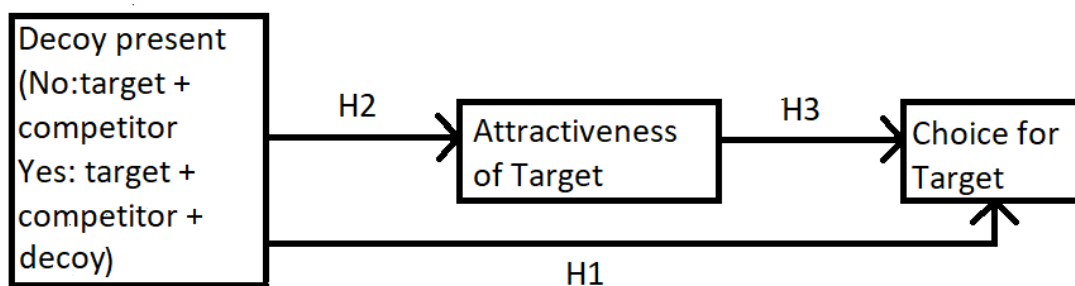


Figure 1. Conceptual framework. The target represents the healthier snack 'Gingerbread less sugar', the Competitor represents the tasty snack 'Luikse waffle chocolate' and the decoy option is the 'Gingerbread Natural'.

### 2.3 Factors that influence the attraction effect

The two explanations for the attraction effect that are mentioned above suggest that decision making processes are likely to be influenced by the interaction of several variables such as task, respondent, and object related ones. A factor that will enhance the strength of the attraction effect is for example decoy similarity. Factors that will moderate the effect are preference strength and task involvement (Mishra et al., 1993). Three factors that influence the appearance of the attraction effect will be used as control variable in this research and thus will be further elaborated upon in the sections below.

### *2.3.1 Decoy similarity*

Decoy similarity was found to enhance the strength of the attraction effect when it occurs (Mishra et al., 1993). Huber & Puto (1983) even suggested that the greater the similarity, the stronger the observed attraction effect. They came up with several reasons for this finding. For example, the addition of a similar object can increase the cost of thinking (Shugan, 1980). Shugan expressed thinking in terms of costs per unit of thought. When provided with more information in the decision making process, it automatically means that more information needs to be overthought and thus increases the cost of thinking overall. According to the rule of thumb, in which the weighting of attributes is being simplified, less weight is being assigned to the weaker attribute when the attraction effect occurs.

### *2.3.2 Preference strength*

Another factor that influences the strength of the attraction effect is the strength of preference that people have for a certain product. Strong preference moderates the attraction effect that occurs when a decoy is added to the choice set. This can be explained by the fact that when people have a strong preference for a certain product, this signifies a strong and stable decision structure and thus are less likely to be influenced by nudges (Mishra et al., 1993). Contrary, respondents without a strong preference are more likely to exhibit the attraction effect, because they will enhance rules of thumb during their decision making process (Kotler, 1991). To further elaborate, when two products in the core set are equally preferred by the consumer, preference strength is low because no clear-cut choice is being made. Therefore Mishra et al., (1993) measured preference strength as a composition of two items: 'centrality of preference' and 'relative preference'. Centrality of preference refers to the division of share among the target and the competitor. When represented in a mathematical way:  $[P*(1-P)]$ , in which P refers to the percentage of share of either item A or item B. This so called centrality of preference can vary from 0.0 to 0.25 in which 0.25 means no preference and a score of 0.0 means a very strong preference for one of the products. In this research centrality of preference will be measured as a control variable.

### *2.3.3 Task involvement*

People are more willingly to process all the available information when they are very involved with the task. Since the attraction effect only occurs when people make use of rules of thumb in their decision making process, the attraction effect is more likely to appear when someone is less involved with the task. A person who is less involved with the task will not consider the choice task to be stimulating enough to spend the effort of processing all the available information to make a good decision, and therefore, will be more likely to demonstrate the attraction (Mishra et al., 1993).

Considering the importance of the above described factors that influence the attraction effect, the variables 'task involvement' and 'preference strength' will be measured and afterwards applied as control variables in this research. Task involvement will be measured by asking a few questions in the questionnaire. Preference strength will be measured in the field experiment with use of the formula of Mishra et al., (1993). It is expected that when people are strongly involved with the task or experience strong preference for one of the items, the attraction effect is also less likely to occur. Both expectations work vice versa.

### 3. Methodology

The current research consists of two experiments. To make sure that the right products were used for the experiments, also a small pilot study was conducted. The first experiment was a choice task that was conducted to investigate whether the perceived attractiveness of the target item was higher in the choice context where the decoy was present, compared to the context without decoy. Another purpose of this experiment was to investigate whether the share of the target item was higher in the choice context with decoy compared to the choice context without decoy. Lastly, task involvement was measured in the questionnaire as a control variable for the attraction effect. Secondly a field experiment was conducted in order to illustrate the effect of adding a decoy in a real life context.

#### 3.1 Pilot study

##### 3.1.1 Introduction

The pilot study was conducted in order to make sure that the products that were chosen for the field experiment and the choice task, could provoke an attraction effect. Therefore, the two items that represent the original choice set should both be strong on one attribute. In this experiment one item should perform strong on healthiness and the other item should perform strong on taste. For the attraction effect to occur it is said that the decoy should be evaluated on its attributes somewhere between the Targets' (T) and the Competitors' (C). The area where the decoy should be placed is visualised in figure 2. Furthermore it is said that for the trade-off contrast to occur, the target should be much stronger on one attribute and only a little bit weaker on the other attribute compared to the Competitor (Felfernig et al., 2008). Therefore, the target item is required to have a high score on healthiness, while taste should be evaluated worse than the competitors'. For the competitor this implies that the attribute healthiness should be evaluated lower and taste should be evaluated better than the target. Since the decoy should be evaluated on its attributes somewhere in between the target and the competitor, it should be evaluated lower on healthiness and slightly stronger on taste compared to the target.

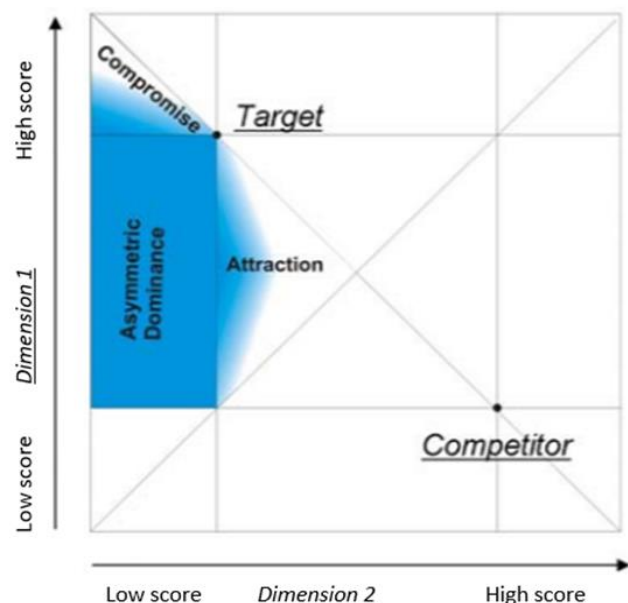


Figure 2. Possible areas for placement of a decoy (Felfernig et al., 2008)

### 3.1.2 Method

#### Design & Procedure

In this pilot study participants were asked to fill in a survey. After the informed consent, two questions followed in which participants were asked about their age and gender. Secondly, a picture was shown to the participants in which the seven products that had to be evaluated were displayed together. After that, the products were displayed one by one and respondents were asked to rate the products on the three dimensions healthiness, taste and attractiveness on a 7-point Likert scale. The means of the evaluated products, were used to decide upon which items were most suitable for the experiments in this research.

#### Participants

Thirty-seven respondents participated in the pilot study. Nine of them were male and twenty-eight of them were female. The respondents were twenty-three years on average.

### 3.1.3 Results

The results from the evaluation of these products are shown in Table 1. As can be seen from these results, the Luikse waffle chocolate is considered to be the most tasty product (M=4.69). The gingerbread less sugar is considered to be the most healthy product (M=4.31). What also can be seen from these results is that gingerbread natural (M=3.78) is considered as more attractive than the gingerbread less sugar (M=3.38).

Table 1. Scores on healthiness, taste and attractiveness of seven snacks (mean and SD).

Product	Healthiness		Taste		Attractiveness	
	Mean	SD	Mean	SD	Mean	SD
Muesli bar naturel	4.21	1.57	4.06	1.59	4.22	1.41
Muesli bar chocolate	3.00	1.22	4.59	1.37	4.41	1.30
Luikse waffle chocolate	1.44	0.70	4.69	1.86	4.13	1.60
Yoghurt biscuit Fruit	3.22	1.39	4.22	1.96	4.16	1.64
Gingerbread natural	3.81	1.38	4.13	1.41	3.78	1.43
Break cake chocolate	1.88	0.78	5.16	1.75	4.50	1.56
Gingerbread less sugar	4.31	1.33	3.38	1.49	3.38	1.45

#### 3.1.4 Discussion

In the selection of the seven products that were used for the survey, the following aspects were considered: price, brand, category and nutritional value. All of the products were AH private label and were also provided with the 'price favourite' label. Furthermore, the category was taken into account since both products need to be substitutes for each other, otherwise they would not compete on the same market. Therefore the products that were chosen belonged in the section with cookies and additionally consisted of five single packages that were designed as a snack portion to take away. For every possible target in the pilot study, the corresponding decoy was a slightly less healthy version of that very product. This was done to make sure that decoy similarity was high, since it was said that this would increase the probability of the attraction effect to occur. Lastly, the nutritional value was considered since people do not only have to think that the product was healthier, but it also had to be healthier, since otherwise it would not be possible for people to make a healthier choice.

From the results it can be seen that the decoy item was perceived as more attractive than the target item. However, for the attraction effect to occur the target option should be more attractive than the decoy item. Since price was not taken into account in the pilot study, it was decided to add this as an extra dimension into the experiment. This was done according to the method that was applied in the study from Ariely & Wallsten (1995). According to this method two of the dimensions should be slightly (110%) dominated by the decoy option compared to the target item and one dimension should be strongly (140%-150%) dominated by the target item compared to the decoy item. The results in this pilot study did not meet these conditions, since the decoy was perceived as more tasty (122.2% compared to the target) and as slightly less healthy (88.4% compared to the target). On overall attractiveness, gingerbread natural scored 111.8% compared to the, which is likely to be caused by the dimensions healthiness and taste since these are the only two dimensions on which participants were questioned. Therefore, it was assumed that the two main dimensions healthiness and taste, had resulted in a slightly better evaluation of the overall attractiveness of the decoy compared to the target. As a result, the third item that had to be added, should be strongly dominated by the target item compared to the decoy item. Price was chosen as the third dimension since this is considered as an important dimension in consumer decision making. Furthermore this dimension could be easily adjusted in the experiment, which was not the case for the already chosen dimensions taste and healthiness. Therefore the price of the decoy was increased with 135% compared to the target (from 1.05 to 1.42).

## 3.2 Experiment 1: Choice task

### 3.2.1 Introduction

This experiment was conducted to answer the main question and both the sub-questions of this research: Q1: *‘What is the effect on choice when a third item (decoy) is added into a choice set consisting of an unhealthy (competitor) and a healthier (target) snack?’*, SQ1: *‘What is the effect on attractiveness of the target option when a decoy is added in a choice set consisting of an unhealthy and a healthier snack?’* And SQ2: *‘What effect does the expected change in attractiveness have on the choice for the target?’*

### 3.2.2 Method

#### **Design & Procedure**

This experiment was a choice task that was designed as a questionnaire, which can be found in appendix A. A between-subjects design was used. Furthermore, two conditions were designed and participants were randomly assigned to one of these conditions. Since the survey was spread among acquaintances, the native language of the researcher was used which was Dutch. After completing the informed written consent, two demographic questions followed in which participants had to fill in their age and gender. Afterwards the participants were asked to imagine themselves being in the following situation: *‘You are doing groceries in your local supermarket. When arriving at the counter, you see a sales table on which cookies packaged in portion sizes are displayed. You did not have cookies in your basket, but you realise that you had intended to purchase such cookies. You watch the offering and choose among the options that are displayed on the table.’* After participants had finished reading the situation sketch, they were randomly assigned to one of the two conditions. The first condition showed a picture of a table that displayed two items. This was the original set and consisted of the target and the competitor. The second condition showed a picture of a table that displayed three items. This was the decoy set and consisted of the same items as the original set, but also included the decoy. In both cases respondents were asked to choose one of the items. When the participants had made their choice, the survey continued with identical questions for all the respondents. In the following question respondents had to rate the attractiveness of the target item on a 9-points scale. Subsequently, respondents were asked to rate on a scale from 1-9 how interesting, enjoyable and pleasant they experienced doing this choice task. The last item questioned whether the choice for one of the products was influenced by allergic or dietary related reasons. The survey ended with thanking the respondents for participating in the experiment.

#### **Participants**

One hundred thirty five respondents participated in the experiment. The survey was distributed among the acquaintances of the researcher. Four respondents were deleted from the analyses because they

did not finish the survey. Another thirteen respondents were excluded from the analyses because they indicated that their choice for a snack had been influenced by allergic or dietary reasons. Therefore hundred and eighteen respondents were included in the data analyses, of which forty one were male and seventy-seven were female. Participants were twenty two years on average (with  $SD=5.775$ ).

### **Measures**

The dependent variable in this experiment was the *choice for the target*. This was measured in two different conditions. The corresponding question to this variable was ‘Which of the following products do you buy?’. In the first condition participants were able to decide between the target and the competitor, while in the second condition the decoy was added as an extra option.

*Attractiveness* was measured with use of a scale variable that ranged from one to nine. The corresponding question to this variable was “How attractive does the ‘Gingerbread less sugar’ appear to you?”. This item served as both dependent and independent variable, which was determined by the analysis that was performed.

*Task involvement* was involved as a control variable and was measured by three different items in the questionnaire. For this variable, respondents had to rate on a scale from one to nine, how interesting, enjoyable and pleasant they experienced doing this choice task. Reliability test showed that the three different items measured the same construct since the Cronbach’s Alfa gave a value of 0.798 which is acceptable. Therefore the three items were merged into one variable that was called ‘Task involvement’.

### **Data analysis**

Before the results were analysed, a binominal variable was conducted as dependent variable, which indicated whether the target option was chosen ‘yes’ or ‘no’ by the corresponding respondent. In the first condition, these two options were the only possibilities to choose from. However, in the second condition, the outcome ‘no’ did not tell whether the participant had chosen the competitor or the decoy option. Since the hypothesis was about the share of the target item, this variable could be changed into a binominal variable, because the share of the target item would remain the same.

*To test hypothesis 1*, corresponding to the main question, a Chi-square Test was performed. The variable that showed whether the target option was chosen or not was used as dependent variable in this analyses. The independent variable was the condition. The cross tabulation was used to visualise the division of choice for target among the two dimensions. The value of the Pearson Chi-Square was considered in order to determine whether the choice for target was significantly different in the two conditions.



*To test hypothesis 2*, corresponding to the first sub-question, an Independent-Samples T Test was performed. This was done to see if the difference in evaluated attractiveness of the target item was significantly higher for condition two (that included the decoy) compared to condition one. Therefore the attractiveness of the target was used in the analysis as dependent variable. Group condition was included in the analyses as the independent variable.

*To test hypothesis 3*, corresponding to the second sub-question, a binary logistic regression was performed to investigate the effect of evaluated attractiveness on the choice for the target item. Therefore the variable that measured attractiveness of target was used as covariate in this analyses. The binomial variable that was conducted to show whether the target option was chosen or not, was included as the dependent variable in this analysis. The Cox & Snell R Squared and Nagelkerke R Square were considered to calculate the explained variation in the dependent variable that was caused by the attractiveness of the target. The odds ratio (Exp B) from the table 'Variables in the Equation' was used to determine the effect of the predicting variable attractiveness on the choice for the target.

*To consider the control variable task involvement*, an Independent-Samples T Test was performed in order to see if task involvement was lower for the people who did choose the target compared to people who did not choose the target.

### 3.2.3 Results

*Hypothesis Main question: H1(Q1): The addition of a decoy in the choice set will lead to an increase of share for the target.*

The conditions to run a Chi-Square test were met since 0% had an expected count less than 5 and the minimum expected count was 19.11. The original set consisted of 55 participants, of whom 38 (69.1%) respondents did not choose the target option and 17 (30.9%) participants did choose the target option. The decoy set consisted of 63 respondents, of whom 39 (61.9%) respondents did not choose the target option and 24(38.1%) participants did choose the target option. The increase of share for the target in the decoy set compared to the original set was 23.3%. These results are visualised in figure 3. Choice for target was found not to be significantly different between the conditions,  $\chi^2(1) = .669$ ,  $p > .05$ .

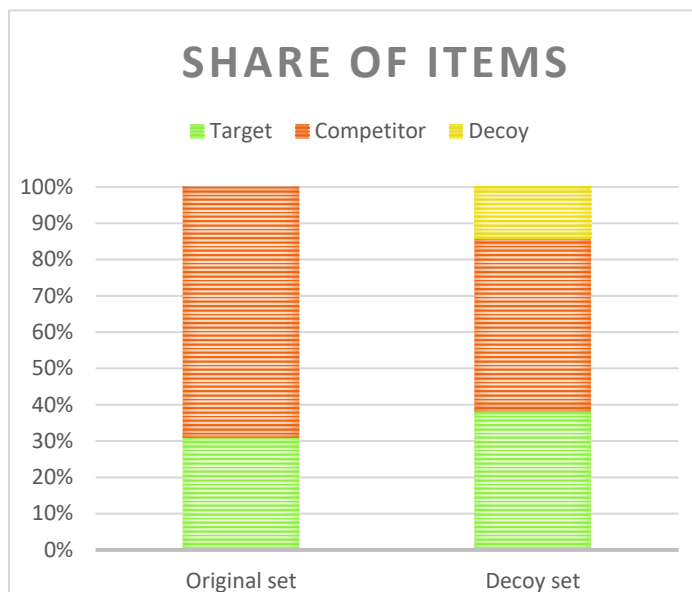


Figure3. Share of items in the Original set and the Decoy set

*Hypothesis Sub-question 1: H2(SQ1): ‘When the decoy that is inferior to the healthier option, is added to the choice set consisting of an unhealthy (competitor) and a healthier (target) snack, the attractiveness of the healthy option increases’.*

Respondents who were assigned to the first condition, consisting of two items, rated the attractiveness of the ‘Gingerbread less sugar’ with a score of  $M=4.87$ ,  $SD=1.95$ . Respondents who were assigned to the second condition, that consisted of three items including the decoy option, rated the attractiveness of the ‘Gingerbread less sugar’ with a score of  $M= 5.57$ ,  $SD=2.05$ . Levene’s Test was not significant  $r=0.77$ , thus equal variances were assumed. With a confidence interval percentage of 90%, a marginal significant difference in the scores for attractiveness was found between condition 1 (original set) ( $M=4.87$ ,  $SD=1.95$ ) and condition 2 (decoy set) ( $M= 5.57$ ,  $SD=2.05$ ) conditions;  $t(116)= -1.89$ ,  $p =0.06$ . Therefore it can be carefully assumed that when the decoy is available in the choice set, the ‘Gingerbread less sugar’ is perceived as more attractive.

*Hypothesis Sub-question 2: H3(SQ2): The more positive the attractiveness of the target is evaluated, the higher the chance the target option will be chosen.*

The Omnibus Tests of Model Coefficients that was derived from the logistic regression analysis, was statistically significant,  $\chi^2(df=1, N=118) = 30.90$ ,  $p < .001$ . Binary logistic regression was used to examine the influence of evaluated attractiveness of the target on choice for the target. The “pseudo” R estimates indicate that the logistic model explained between 23.0% (Cox & Snell R Squared) and 31.8% (Nagelkerke R Squared) of the variance in choice for the target. It correctly classified 79,7% of the cases. The odds of choosing the target option was increased by a factor 1.95 for each unit increase in evaluated attractiveness of the target.

#### *Control variable*

It was expected that for the group of people who scored high on task involvement, the attraction effect would be weaker or would not occur at all. Group statistics showed that people who did choose the target item scored on average 4.02 (with SD = 1.75) on task involvement, whether people who did not choose the target item scored on average 4.78 (with SD = 1.65) on task involvement. Results of the Independent Samples T-Test, confirmed that the difference in task involvement between people who did choose the target option compared to people who did not choose the target option was statistically significant;  $t(116) = 2.34, p = .02$ .

#### *3.2.4 Discussion*

The attraction effect is occurring when the target option is evaluated more positive due to the addition of a decoy. This effect was found in the results of this choice task, however the significance was marginal. Therefore we must be careful in assuming that the increase of attractiveness of the target was caused by the addition of the decoy. The main question investigated whether the addition of the decoy would be strong enough to make people choose the target option. The target option did show a small increase in share, however this finding was not significant. Since it was said that low task involvement would enhance the probability of the attraction effect to occur, this variable was measured to see if people who did choose the target item indeed indicated a lower task involvement. It was found that people who did choose the target item indicated a lower task involvement on average (4.02 for people who did choose the target, compared to 4.78 for people who did not choose the target).

Remarkably was that the target did not lose share after the decoy was added in the set. It was found that all the share that the decoy had gained, was derived from the share that originally belonged to the competitor. This violates the similarity hypothesis that assumes that new products take disproportionately more share from products that appear similar to it than from those that are dissimilar. Therefore it can be suggested from these results that decision making in this experiment was not based on rational considerations. Especially when considering the similarity of the decoy and the target, and noticing the difference in price.

Regarding the fact that the decoy had gained share in this experiment, it can be stated that the decoy was still too attractive after the dimension price was added into the choice context. Another explanation for the share of the decoy could be that people had not noticed the price. To prevent the decoy from gaining too much share it could be decided to choose another area for placement of the decoy. For example, Felfernig et al., 2008 discussed several possible placements of a decoy. One of

these possibilities was explained to evoke the so-called 'compromise effect'. This effect occurs in a situation in which the decoy is slightly better in one attribute and much lower on the other attribute. The data of the pilot study suggested that the Gingerbread less sugar was more suitable to serve as a decoy than the Gingerbread natural, since it was considered less attractive. Since the Gingerbread natural can also be considered as a healthier option, it could have also be decided to target this option. However, this study was designed to investigate whether a decoy could be used in order to nudge people towards a healthier choice. Therefor is was decided to make the most healthy option serve as a decoy and to add an extra dimension to the choice set. However, the correctness of this decision can be questioned when considering the share of the decoy in this experiment.

Lastly, findings suggested that an increase in task involvement, moderates the attraction effect. Therefor it is suggested for further research, to measure task involvement for several products previously to the actual experiment and to consider these results when deciding which products to use.

### 3.3 Experiment 2: Real life

#### 3.3.1 Introduction

The purpose of this real life experiment was to illustrate the addition of a decoy into a choice set in a real life context. Furthermore, the main question of this research will be answered with the data that is gathered in this experiment. The corresponding hypothesis to this question is *H1(Q1): 'The addition of a decoy in the choice set will lead to an increase of share for the target'.*

#### 3.3.2 Method

##### Design & procedure

The quasi-experimental field experiment was conducted during two weeks and took place in the supermarket 'Albert Heijn' located in IJsselstein. During the first week only the target and the competitor were displayed on the table near the checkout (Figure 4). Both products had the same amount of space on the table to make sure they had an equal chance to be noticed by the customers. The importance of the results from the first week was to see how the share among the two products was initially divided and how both products were preferred by the costumers. During the second week the decoy was added on the table (Figure 5). Again all three products got an equal amount of space on the table. The importance of the results of the second week was to see whether the target gained share from the competitor after the decoy was added into the choice set.



Figure 4. Field-experiment Week 1

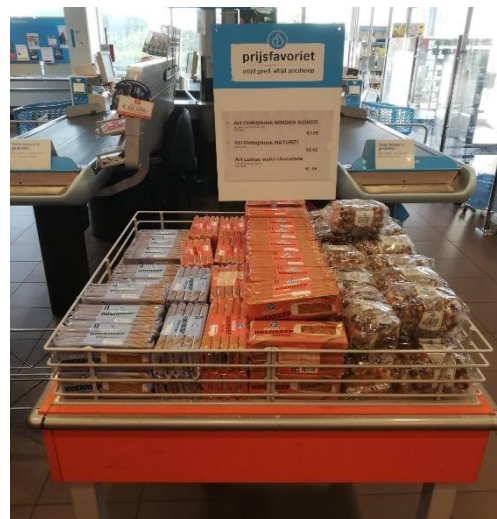


Figure 5. Field-experiment Week 2

The four weeks previous to the actual experiment, sales data from the three items that were used in this experiment were gathered (corresponding data can be found in table 3 in Appendix B). This was done to investigate how often these products were purchased on average on a daily base. This information was useful for this experiment in order to determine whether purchases were derived from the shelf or from the table that belonged to the experiment. Taking into account the means of

the purchases per day, which was below 1pcs. for all items, it was decided not to consider the probability that purchases of these products were also derived from the shelf. The sales data from the experiment were used to determine whether the share of the target item had increased after the decoy was added into the choice set. The sales data from the first week were also used to measure the preference strength of the consumers. Preference strength was measured as a control variable in this experiment. This was decided in order to check whether the products that were chosen for the experiment, were likely to provoke an attraction effect. According to Mishra et al., (1993), the centrality of preference for a certain item can be measured by the formula  $P*(1-P)$ , in which P is the share in percentage of the target. The sales data from the second week was used to see whether the target item had increased its share compared to the first week of the experiment.

### **Measures & data analysis**

Before analysing the results of the second week, one outlier was noticed. On day 11 of the experiment, 48 pieces were purchased of the target item. This was due to a costumer who ordered 32 pieces of the target item. To prevent the dataset from unrealistic outcomes, this order was excluded from the analyses and was accounted for as one piece.

From the data that was derived from the experiment, two variables were computed. The variable that expressed the amount of purchases from the target, was turned into a variable that showed its share relative to the rest of the items in the choice set. The same was done for the competitor. This implies that the share in the first week was based on the purchases of two items, whereas in the second week this percentage was based on three items. This was due to the decoy that was only present during the second week of the experiment.

The variables '*Target share*' and '*Decoy share*' were both used as dependent variables in this experiment. As explained above, they were expressed in the share they possessed, relative to either the other option (week1) or the other two options (week 2) that were available in the choice set. The variables both showed information about the sales per day.

*To test hypothesis 1*, corresponding to the main question, a univariate ANOVA was performed. This was done in order to see if the target option had significantly increased its share after the decoy was added into the choice set. Therefore, the variable '*Target share*' was used as dependent variable in this analysis. The week number (week 1 or week 2) was included as independent variable. With use of the same analysis, but with '*Competitor share*' as dependent variable, it was also investigated whether the competitor had significantly decreased its share after addition of the decoy into the choice set. The F-

value and the corresponding significance value that were displayed in the table 'Tests of Between-Subject Effects', were interpreted in order to answer the main question.

### 3.3.3 Results

Sales data from the two weeks of this experiment can be found in table 2 below. These results are also visualised in figure 6. As these results show, the amount of share for the target and the competitor in week 1 (the original set) was equally divided. 66 Pieces (46.8%) were purchased of the target and 75 pieces (53.2%) were sold of the competitor. In the second week the total amount of purchases was 61 pieces (49.6%) from the target, 40 pieces (32.5%) from the competitor and 22 pieces (17.9%) from the decoy.

Table 2. Sale results week 1 and week 2 of the experiment. Target (Gingerbread less sugar), competitor (Luikse waffle chocolate) and decoy (Gingerbread natural).

<b>Week 1</b>	<b>Day 1</b>	<b>Day 2</b>	<b>Day 3</b>	<b>Day 4</b>	<b>Day 5</b>	<b>Day 6</b>	<b>Day 7</b>	<b>Total</b>
Target	11 44.0%	8 50.0%	13 56.5%	13 44.8%	11 52.4%	7 36.8%	3 37.5%	<b>66 (pcs.) 46.8%</b>
Competitor	14 56.0%	8 50.0%	10 43.5%	16 55.2%	10 47.6%	12 63.2%	5 62.5%	<b>75 (pcs.) 53.2%</b>
	25 100%	16 100%	23 100%	29 100%	21 100%	19 100%	8 100%	<b>141 (pcs.) 100%</b>
<b>Week 2</b>	<b>Day 8</b>	<b>Day 9</b>	<b>Day 10</b>	<b>Day 11</b>	<b>Day 12</b>	<b>Day 13</b>	<b>Day 14</b>	<b>Total</b>
Target	6 46.2%	4 23.5%	18 75.0%	17 58.6%	7 38.9%	3 23.1%	6 66.7%	<b>61 (pcs.) 49.6%</b>
Competitor	4 30.7%	8 47.1%	5 20.8%	9 31.0%	6 33.3%	6 46.2%	2 22.2%	<b>40 (pcs.) 32.5%</b>
Decoy	3 23.1%	5 29.4%	1 4.2%	3 10.4%	5 27.8%	4 30.8%	1 11.1%	<b>22 (pcs.) 17.9%</b>
	13 100%	17 100%	24 100%	29 100%	18 100%	13 100%	9 100%	<b>123 (pcs.) 100%</b>

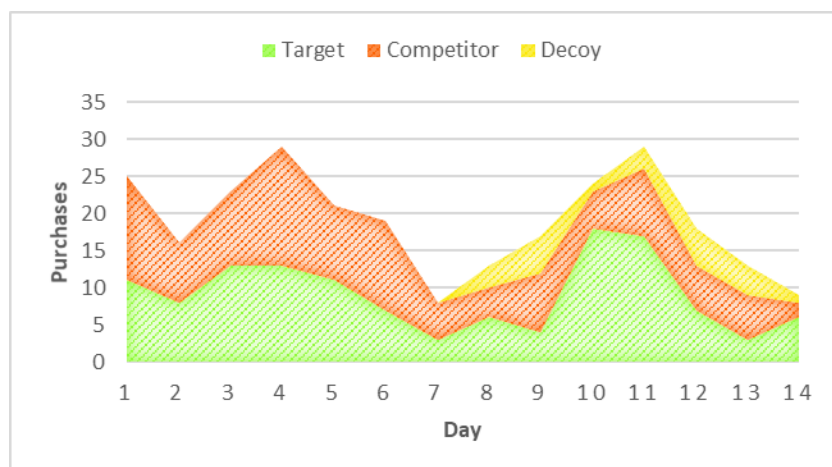


Figure 6. Share in sales of Target, Competitor and Decoy. (Original set was displayed on day 1-7, Decoy set was displayed on day 8-14)

Further analyses of the results from the second week, was performed with the univariate ANOVA test. From these results it can be seen that the target option had increased its share with 6.0% (from 46.8% to 49.6%). However, results of the univariate ANOVA show that this increase in share was not statistically significant;  $F(1) = .03$ ;  $p = .87$ . What also can be seen from the results is that the share of the competitor had decreased with 38.9% (from 53.2% to 32.5%). Results of the univariate ANOVA do show that the difference of share from the competitor is significantly lower in the second week compared to the first week of the experiment;  $F(1) = 18.92$ ;  $p = .00$ .

#### *Control variable*

Filling in the formula  $P^*(1-P)$  with the corresponding results of this experiment, gave a centrality of preference of 0.212. Therefore it can be assumed that preference strength in this case is low, which increases the probability of the attraction effect to occur.

#### *3.3.4 Discussion*

In both the choice task and the quasi-field experiment, the same effect was found: After addition of the decoy, the target option slightly increased its share, while the competitor lost a part of its share to the decoy. However, the decoy was implemented in order to increase the share of the target, and not to obtain share itself. This again suggests that the decoy was still too attractive. Another reason for its lack of functioning could be due to the area in which the experiment was located. Namely, the experiment was set up at the area where normally the impulse-baskets are placed. This could have caused people to be less focussed on the price, since normally the cheaper products are placed in this area. This would be of influence upon the outcome, since the dominance of the target over the decoy was mainly based on its price.

Even though the attraction effect was not found in the field experiment, people did not choose according to the rational Model of Choice. According to the similarity hypothesis that this model assumes, new products take disproportionately more share from products that appear similar to it than from those that are dissimilar. This was not the case for the Gingerbread natural that was added as new product into the choice set, since all its share was deducted from the Luikse Waffle. Therefore this finding is inconsistent with the similarity hypothesis. However, the attraction effect also assumes inconsistency with the assumption of regularity, which implies that the addition of the decoy would result in an increase of share of the target. This increase was too small and not statistically significant.

The period in which the results of this experiment were gathered, fell together with the Pentecost weekend (day 6-8). It can be clearly seen from the results in Figure 6 that purchases of the items were



lower during these days. However, another decrease of purchases can be seen in the second weekend which is represented by days 13 and 14. Therefore it is unclear whether results are being influenced by the holidays or whether this was due to the weekend. Regardless of the reason for this decrease of purchases, it must be mentioned that consumer behavior is likely to be different during holidays compared to standard days (Mak et al., 2012).

As explained before, it was decided not to make a distinguish between purchases that were derived from the table (the experiment) or from the shelf. However when this had been considered, the difference in share from the items in the second week might have been even bigger, since the relative difference between the three items would presumably increase when the purchases that were derived from the shelf would be subtracted from the dataset. This is assumed because the target item was purchased the most during the second week (61 pieces) in the experiment, while the mean of purchases of the target item in the four previous weeks to the experiment was 0.46 per day. For the competitor the amount of items sold was 41 pieces during the second week of the experiment, while the amount of purchases of the target item during the four previous weeks to the experiment was on average 0.93 per day. Therefore the relative difference would be even bigger when the purchases from the shelf would be subtracted from the results and therefore the attraction effect would probably occur more strongly. However it was not possible within the design of the current research to take this into account. For future research however, it could be decided to investigate the attraction effect with products that are not available within the actual assortment of the store in which the experiment takes place. This approach rules out the possibility that products are purchased outside the experimental setting, and as a result wrongly affects the outcome.

#### 4. Overall discussion

This study investigated the effect of the addition of a decoy in the choice set upon the choice for the target item. It was expected that when the decoy was added into the choice set, choice for the target option would increase. In both the choice task and the field experiment, the share of the target option was not significantly higher when the decoy option was included in the choice context. However, both studies showed a certain effect which could be expected according to the hypothesis. The results of the choice task showed that attractiveness of the target option was evaluated higher (marginally significant) for the respondents who were assigned to the choice context in which the decoy option was available, compared to the respondents who were assigned to the choice context without the decoy option. Furthermore both experiments showed that when the decoy was added into the choice context, the total amount of share that the decoy had acquired, was only taken from the share that originally belonged to the competitor.

According to the outcomes of this research, the addition of the decoy had not resulted in a bigger share of the target and therefore the hypothesis corresponding to the main research question, could not be approved. In contrast to the current study, several studies that also investigated the influence of a decoy did find an attraction effect. However, what most of these studies characterises, is that the choice context is demonstrated to the participants in an artificially structured way. For example in the study of Ariely & Wallsten (1995), the influence of a decoy was investigated with five different products. All of the products were provided with information about three dimensions. For example, microwaves were evaluated based on price, capacity and wattage. In contrast to the values healthiness and taste that were used in the current research, these dimensions were provided with a certain value. From these values it was easily to derive whether the product performed good or bad at this dimension, which made it more easy for the participants to compare the items in the choice set. In the current research, the dimensions of the products were not valued, which resulted in a less structured comparison. This can partially be explained since most of the research that has been done to the attraction effect, is not food-related.

Even though it might not have resulted in observing the attraction effect, the strength of this research is that it provides a truthful picture of the reality. Besides the realistic way in which participants were exposed to the products in the lab-experiment, the effect was also investigated in a real-life experiment, which strengthens the internal and external validity of this research. Another strength of

this research is that it has investigated the attraction effect with food-related products, which is a category that is barely investigated regarding the attraction effect.

This study has also some limitations that should be acknowledged. Firstly it can be questioned whether the Gingerbread natural was suitable as a decoy. This can be doubted since the results from the pilot study show that the Gingerbread natural is evaluated better on its attractiveness than the Gingerbread less sugar. Furthermore, results from both experiments show that the decoy is chosen or purchased approximately 15%. This can be considered as too much, since a decoy should move share from the competitor to the target, but not to itself. Another limitation of this study was due to a lack of time. The field experiment was conducted during two weeks and therefor a modest amount of data could be gathered. Especially when it is considered that the experiment took place during the Pentecost weekend, results might have been more realistic when the duration of the experiment was increased.

When considering this research for practical implications, it is useful to acknowledge the probability that the decoy effect is more likely to occur when the products that represent the choice set can be evaluated based on concrete dimensions. As a consequence it becomes easier to make a comparison between the displayed products, which is one of the explanations for the attraction effect according to Huber & Puto (1983). For most food related products, the evaluation is mainly based on dimensions like taste and healthiness (Furst et al., 1996). Therefor the decoy effect is not expected to be very efficient to be implemented as a nudge in a food-related context, such as a supermarket. For future research it could be investigated whether the addition of a decoy could be useful for food-related products when it is applied in an online setting. This is suggested since it might be more easy to create a setting in which products can be compared in a structured way, when this comparison takes place online. Furthermore there is evidence that the addition of a decoy effects the evaluation of the target item. Therefor it might be useful to consider this knowledge when for example launching a new product. This is suggested since it is likely to suppose that when a new product is launched, it has not been evaluated before. Therefor the effect of the decoy on the evaluation of the product might be stronger compared to when someone already has previous experiences with the particular product. However this is only expected, therefor it might be interesting for further research to investigate the characteristics of the products for which the implementation of a decoy is the most effective.

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## Appendix

### A. Questionnaire

Q1 Fijn dat u mee wilt doen aan dit onderzoek van Wageningen Universiteit! Deze vragenlijst gaat over uw keuze voor een tussendoortje. Het invullen van deze vragenlijst zal ongeveer 2 minuten duren en als deelnemer blijft u geheel anoniem. Er zijn geen risico's verbonden aan het invullen van de vragen en u kunt op ieder moment besluiten te stoppen. Voor eventuele vragen kunt u contact opnemen met Rachel van der Krift (rachel.vanderkrift@wur.nl) Door op 'ja' te klikken, geeft u aan dat u bovenstaande hebt gelezen en ermee instemt:

- ☐ Ja, ik doe mee aan dit onderzoek.
- 

Q2 Wat is uw leeftijd?

Q3 Wat is uw geslacht?

- ☐ Man
  - ☐ Vrouw
  - ☐ Wil ik niet zeggen.
- 

Q4 Beeld u zich de volgende situatie in. U doet boodschappen bij uw lokale supermarkt.

Wanneer u aankomt bij de kassa, ziet u een tafel staan met daarop koeken voor onderweg. Deze heeft u nog niet in uw winkelmandje, maar u bedenkt zich dat u deze eigenlijk wel wilde aanschaffen. U bekijkt het aanbod en maakt een keuze voor een van de producten die op deze tafel staan.

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*Respondents are randomly assigned to condition 1 or condition 2*



### Condition 1

Q5 Welke van deze twee producten koopt u? (Klik dit product aan op de afbeelding)



### Condition 2

Q6 Welke van deze drie producten koopt u? (Klik dit product aan op de afbeelding)



All participants continued the survey with the following questions.

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Q7 Hoe aantrekkelijk vindt u de 'Ontbijtkoekreep minder suiker'?

1      2      3      4      5      6      7      8      9

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Q8 Hoe ervoer u het om een keuze te maken voor een van de producten?

	1=Totaal niet								9=Heel erg
Interessant	1	2	3	4	5	6	7	8	9
Plezierig	1	2	3	4	5	6	7	8	9
Aangenaam	1	2	3	4	5	6	7	8	9

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Q9 Is uw keuze voor het tussendoortje beïnvloed omdat u allergieën heeft of een dieet volgt?

- ☐ Ja
  - ☐ Nee
- 

Q10 Aan Wageningen Universiteit worden vaker studies verricht waarvoor wij op zoek zijn naar deelnemers. Mogen wij je hiervoor af en toe (maximaal 1 keer per maand) benaderen per e-mail? Zo ja, schrijf hieronder je e-mailadres (niet nodig als je al op deze lijst staat):

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Hartelijk bedankt voor uw deelname!

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## B. Sales data field experiment

Table 3. Sales data from the four previous weeks to the field experiment

Day	Target	Competitor	Decoy	Customers
1	0	0	0	2306
2	0	3	0	2187
3	1	1	2	2209
4	0	2	2	2311
5	0	1	0	3069
6	3	0	0	2861
7	0	0	0	1401
8	0	0	4	2430
9	0	1	1	2402
10	0	3	0	2479
11	1	1	0	2341
12	1	0	0	2984
13	2	2	1	2636
14	0	0	0	1491
15	0	1	1	2296
16	0	0	1	2137
17	0	1	0	2611
18	1	1	1	2355
19	1	1	1	3046
20	1	2	0	2864
21	0	0	0	1768
22	1	4	1	2388
23	0	0	0	2065
24	0	1	1	2698
25	1	0	1	1573
26	0	1	2	2969
27	0	0	0	2489
28	0	0	0	1561
Mean	0,46/day	0,93/day	0,68/day	2355/day