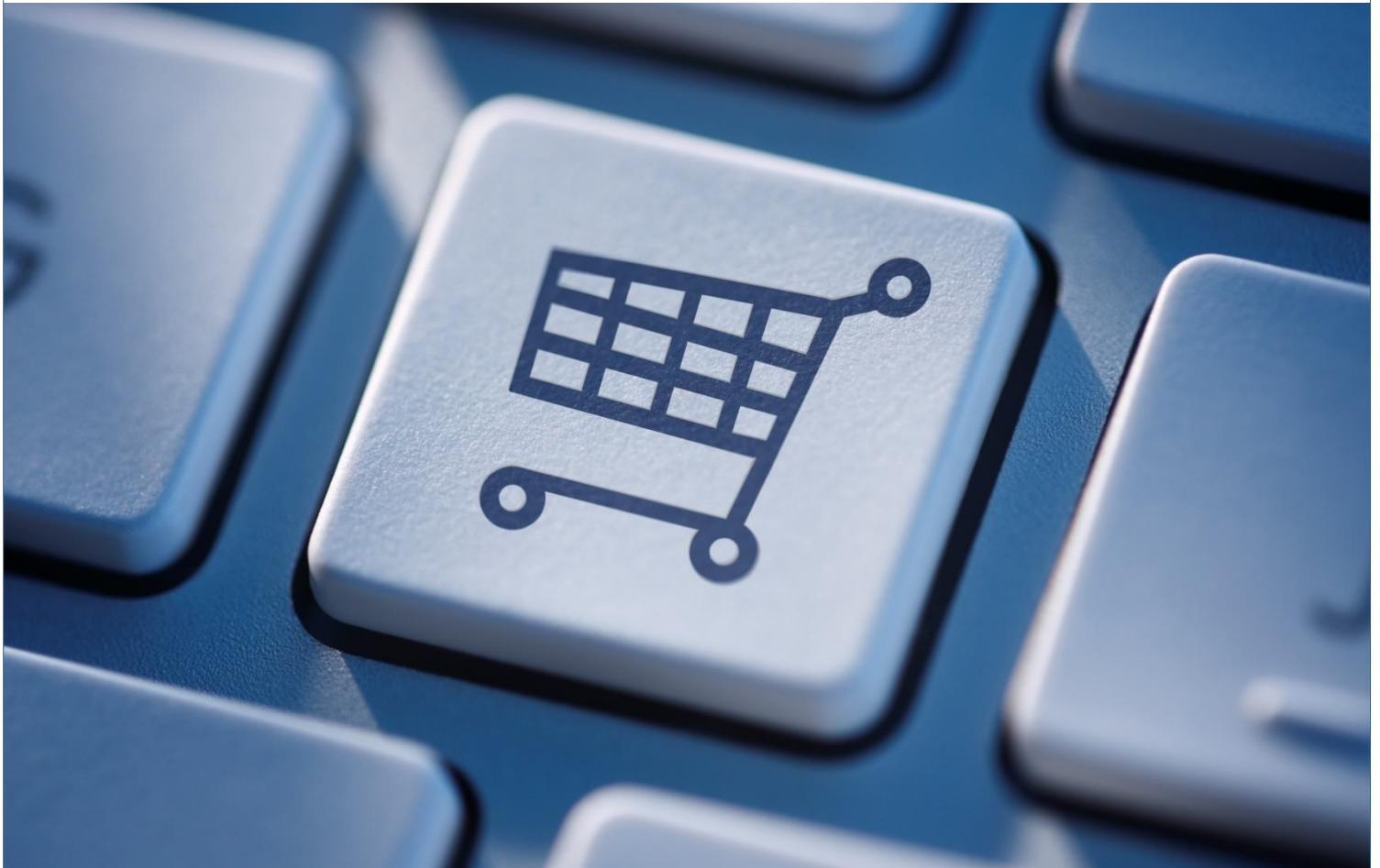


The influence of normative feedback on healthy food choices online



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MSc thesis

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Abstract

Sugar consumption of 70% of Dutch adults is higher than the World Health Organization recommends. The use of social norms to help people make healthier food choices is promising, but has not yet been studied in an online shopping environment. This study sought to discover what influence normative feedback has on online food choices. This is tested through an online administrated experiment, in which 386 participants selected cookies to buy. 224 participants (168 female) chose unhealthy cookies and received either (manipulated) social normative feedback based on the sugar content of their chosen product, feedback from the Dutch Nutrition Centre or no feedback, all along with alternative healthier products. Findings showed that both normative feedback and feedback from the Dutch Nutrition Centre resulted more often in revision to a healthier choice than only product suggestions in the control condition did. In the condition of the Nutrition Centre, most healthy choices were made and participants compared themselves most to others. Higher social comparison was found to be correlated with higher feelings of inaccuracy and feelings of punishment, which were in turn related to revision of choice. The current study extends prior research on social norms and food choice by showing that social norms remain effective in an online shopping environment, which provides practical implications for the Nutrition Centre and online retailers.

Key words: Normative feedback; descriptive norm; healthy food choice; online grocery shopping; social upward comparison

Preface

Dear reader,

After working on it for the past months, here it is: my master thesis about how normative feedback influences online food choices. This MSc thesis is written for the chair group Marketing and Consumer Behaviour (MCB), as part of my master program Management, Economics & Consumer studies at the Wageningen University. It is interesting to read for students who want to learn more about normative feedback in relation to healthy food choices in an online grocery shopping environment, as well as for managers as academic support on this topic.

Writing this thesis has not only led to a contribution to science about normative feedback, it has also been a valuable learning experience. The meetings with people from Ahold and Amped in which we brainstormed about the use of normative feedback for customers of AH.nl were helpful and gave me a lot of energy to work on my thesis. It was a nice challenge to make my online experiment look as similar as possible to the real-life situation and I received positive comments about it from participants.

My supervisors helped me to stay motivated to continue with and finish my thesis despite that the collaboration with Ahold could not continue and gave me time to recover from my RSI. I would like to express my sincere gratitude to Ellen van Kleef for her guidance and enthusiasm throughout the past months. After a brainstorm with her I was always happy to continue with my thesis. Also the feedback from Hans van Trijp has led to large improvements of my thesis, the comments he gave have made me think about the topic more critically. Furthermore, I owe my friends and roommates gratitude for listening to my ideas as well as struggles about this thesis during breaks at the university and evenings at home. Lastly, I would like to thank my parents who made it possible for me to study at this university.

I am proud of the end result that is now lying in front of you. The last thing I would like to say for now is: Other readers like you really liked my thesis, so I hope you will enjoy reading it too.

Kind regards,

Anke van 't Klooster

Wageningen, May 2017

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1. Introduction

At the moment, 50% of all adults in the Netherlands are overweight compared to only 33% of all adults in 1981 (CBS, 2016). Unnecessarily high energy intake is contributing to this weight increase and is primarily caused by unhealthy eating behavior. High sugar intake appears to be an important factor in weight gain and increased risk of diabetes and cardiovascular disease (Johnson et al., 2007; Malik, Popkin, Bray, Després, & Hu, 2010). The World Health Organization (WHO) strongly recommends to have less than 10% of your daily energy intake consisting of free sugars¹ to reduce this risk (WHO, 2015). Unfortunately, many people do not comply with this guideline: For about 70% of Dutch adults the free sugar intake is more than 10% of their daily energy intake (Sluik, Lee, Engelen, & Feskens, 2016).

To help people make healthier food choices, different strategies have been used in the past. Providing information is often used in the aim of changing unhealthy eating behavior, but unfortunately this has shown to have limited effectiveness (Garcia, 2007; Marteau, Hollands, & Fletcher, 2012; Variyam & Cawley, 2006). Reasons for this are that humans have limited capacity for processing information and have problems with self-control (Downs, Loewenstein, & Wisdom, 2009). In studies concerning promotion of sustainable behavior another strategy has been proven to be effective: namely the use of social norms (Allcott, 2011; Goldstein, Cialdini, & Griskevicius, 2008; Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). A distinction can be made between descriptive norms and injunctive norms. Descriptive norms can be defined as "the perception of what most people do" and injunctive norms as "the perception of what most people approve or disapprove" (Cialdini, Kallgren, & Reno, 1991, p. 2). Even though you might not perceive the behavior of others important, it actually does have an influence on your own behavior. For example, a study performed by Nolan and colleagues (2008) shows that respondents indicated normative beliefs were least important in their energy conservation decisions. Nevertheless, it appeared that normative beliefs were more predictive of energy conserving behavior than other relevant beliefs (e.g. saving money, social responsibility and environmental protection). This shows the potential of social norms to influence behavior. Since the effect of descriptive norms on behavior is larger than that of injunctive norms, the focus in this study will be on the use of descriptive norms to influence behavior (Manning, 2009; Van Herpen, Melnyk, Jak, & Van Trijp, 2016).

Focusing specifically at eating behavior, social norms also appear to have an effect on food choice. Robinson, Thomas, Aveyard and Higgs (2014) have analyzed 15 studies on the influence of social norms. They found that participants were more likely to make food choices similar to others when norms describe food choices of others. Cruwys, Bevelander and Hermans (2015) reviewed 69 studies to discover when and why social influence has an effect on food intake and choice. It appeared that there is "near universal support for the finding that people's food intake and choices are shaped by the norms provided by others" (Cruwys et al., 2015, p. 15). Thus, besides an effect of social norms on other types of behavior, this is consistent evidence that norms have an influence on food choices.

¹ Free sugars: "refer to monosaccharides (such as glucose, fructose) and disaccharides (such as sucrose or table sugar) added to foods and drinks by the manufacturer, cook or consumer, and sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates." (WHO, 2015)

Social norms are already used in a variety of marketing campaigns (Berkowitz 2005; Schultz et al., 2007). Also for marketing in online shopping environments like at Wehkamp, Bol.com and the online supermarket of Albert Heijn interests of customers are compared to those of others by showing products that 'others also bought', which seems to be effective. An effect of social norms on different types of online shopping behavior has been found (Demarque, Charalimbides, Hilton, & Waroquier, 2015; Duan, Gu, & Whinston, 2009; Tucker & Zhang, 2011), but the influence of social norms on online food choices has not been examined and social norms are not yet applied for the goal of making healthier food choices in the online shopping environment. So, there is a knowledge gap about whether social norms would have a positive effect on the healthiness of online food choices. The current study will therefore focus on achieving this health goal, as online grocery shopping is also getting more important in the current society. Where in 2014 already 10% of the Dutch indicated to have done online grocery shopping within six months before they participated in the research, this has increased to 18% in 2016 (GfK, 2016). Revenue from online grocery shopping is expected to grow with 30% in 2017 (FD, 2016). This growth makes online grocery shopping an interesting and important field to do research in, as it probably will keep on growing in the coming years. Making use of social norm strategies in an online shopping environment gives the possibility to personalize the norms shown to customers and offer alternative products for every customer. This would be infeasible in a traditional supermarket, where customers would have to put a lot of effort to return their original products and gather alternative products throughout the store.

Online grocery shopping is in many ways different from doing grocery shopping in an offline supermarket. All ingredients needed for a certain recipe can be added at once to the shopping basket, product information is presented clearly in the same way for all products instead of differently at the back of product packages, products can more easily be added or deleted from the shopping basket, but products cannot be touched or smelled. As the experience is different, also shopping behavior of online grocery shoppers is different from traditional supermarket shoppers (Andrews & Currim, 2004; Degeratu, Rangaswamy, & Wu, 2000). From a study testing differences in choice behaviors for liquid laundry detergent and margarine it appeared that online consumers were less sensitive to prices, preferred larger sized packages to smaller sized packages, did more screening on the basis of brand names and less on the basis of package sizes (Andrews & Currim, 2004). For the current study a lower price sensitivity of online grocery shoppers could mean that having to pay extra for a healthier product might not be a problem for them.

What makes this study unique besides the focus on healthy food choices in an online setting, is that normative feedback is provided after products are chosen. In contrast, other studies use social norms to influence behavior before a decision is made. By giving normative information after the decision in this study, this creates the chance to give personalized feedback on the choice that is made as well as the challenge to change the initial choice consumers have made.

The aim of this empirical research is to gain insight in the influence of social normative feedback on online food choices. The main research question hence is:

Does social normative feedback increase the likelihood that online grocery shoppers change their food choice to a healthier choice?

Also the underlying motivation of consumers to change their behavior due to the social normative feedback provided is sought for. This has been tested through an online administrated experiment, in which participants selected cookies to buy and received (manipulated) social normative feedback based on the sugar content of their choice along with alternative healthier products. The influence of social normative feedback is compared to the influence of feedback from an external expert source, the Dutch Nutrition Centre (het Voedingscentrum), and to no feedback, to discover how much bigger the influence of social normative feedback is in comparison with feedback from an external source. The insights of this study can be used to understand how to help consumers in making healthier food choices online. It contributes to the current literature on social norms and gives useful insights for online supermarkets. In the end, healthier choices will hopefully lead to healthier and less overweight people.

2. Theoretical framework

2.1 Environmental influences during online grocery shopping

There are many influences on food choices in online grocery shopping. A consumer needs to decide whether he will buy the product he intended to or whether he will choose for an alternative product when this is offered to him. At that point of decision there are several factors that can help the consumer in deciding what to buy; such as the perception of intrinsic and extrinsic characteristics of the product, the product price, previous experience with the product and social influences. The focus in this study will be on social influences.

2.1.1 Social norms

Different theories have been proposed in the past about social influences on behavior. One of these is the focus theory of normative conduct of Cialdini, Reno and Kallgren (1990). This theory focusses on one of the six categories in persuading people that were defined by Cialdini: social proof (1987). That is, the right thing to do is usually the thing that a lot of people do. Our social environment can thus have an influence on how we behave according to the focus theory of normative conduct, by so called 'social norms'. Social norms are "rules and standards that are understood by members of a group, and that guide and/or constrain social behavior without the force of laws" (Cialdini & Trost, 1998, p. 152). When for example eating only a small portion of food is the norm, it is likely that people will eat less than in cases where people around them eat a lot (Robinson et al., 2014).

The research of Cialdini, Kallgren and Reno (1990; 1991) shows that both proponents and opponents of the focus theory of normative conduct can be right about the strength of the influence of social norms. They explain that part of the mixed views and findings on the role of norms in behavior is caused by the use of the term 'norm', since it is used for different types of norms. A distinction can be made between descriptive and injunctive norms and they can have a different impact on behavior, which will be explained in the next paragraph. Also, the theory states that the impact of the norm is dependent on whether the focus attention is on or away from the norm. Persons are more likely to act conform the norm when the norm is made salient. For example, a study on littering showed that injunctive norms had an impact on behavior only when the norms were focal (Kallgren, Reno, & Cialdini, 2000). In the high norm-focus condition a man picked up a fast-food bag lying on the ground a few meters in front of the participant who was entering a parking garage, in the low norm-focus condition the man just walked by the participant so no attention was drawn to the antilittering norm. Arriving at their cars, participants encountered either one or two handbills attached to their windshield. It appeared that participants in the high norm-focus condition that received two handbills littered the least, 9.4%, compared to 25.6% in the condition with high focus on the norm and one handbill and 42.5% in the low norm-focus condition and one handbill. In an online grocery shopping normative feedback on product choice can be provided to shoppers in a separate screen, which makes it relatively easy to put focus on the norm in comparison to a traditional supermarket with many other distractions and thus more likely to be effective. Besides a focus on the social norm, also credibility of the norm information contributes to the success of using social norms to influence behavior. The effectiveness of normative feedback has found to be higher in cases where the credibility of the normative message was higher (Gotlieb & Sarel, 1990; Polonec, Major, & Atwood, 2006).

2.1.2 Descriptive and injunctive norms

The two types of social norms, descriptive and injunctive, can have different influences on behavior, by evoking different processes. Both types of norms concern the behavior of others, but injunctive norms describe behavior that is approved of by most people, while descriptive norms simply describe how most people behave. Descriptive norms appear to have a bigger influence on behavior and are therefore more appropriate to use in interventions to change behavior. Van Herpen and colleagues (2016) analyzed 297 studies in consumer behavior in order to find out what effects descriptive and injunctive norms have. From their meta-analysis it appears that descriptive norms mainly influence behavior directly, whereas injunctive norms show a weaker influence on behavior. Descriptive norms are processed more heuristically, whereas injunctive norms evoke more processing as people start to think of what is approved. They were found to have a stronger influence on attitudes and through attitudes they indirectly influence behavior.

The findings of Van Herpen and colleagues are consistent with the results from the meta-analysis performed by Manning (2009). He examined the effects of perceived descriptive and injunctive norms on behavior within the theory of planned behavior for 196 studies. The total effect of descriptive norms, consisting of direct effects on behavior and indirect effects through behavioral intentions, was found to be greater than the total effects of injunctive norms on behavior. The lower total effect of injunctive norms on behavior can partly be explained by the negative relation for the direct effect of injunctive norms on behavior (Manning, 2009).

An additional explanation for a lower effect of injunctive norms compared to descriptive norms is that psychological reactance can occur. This means that the norm might motivate people to reject the normative feedback and respond negatively towards it (Dillard & Shen, 2005). As injunctive norms are telling people how they should behave according to others, they are more restricting and lead to a higher threat of freedom than descriptive norms (Stok, Ridder, Vet, & Wit, 2014). In the case of online grocery shopping, it is possible that providing feedback, independent of the source, leads to reactance as previous studies have shown that recommendation services can cause reactance (Fitzsimons & Lehmann, 2004; Lee & Lee, 2009).

2.2 Social influence through comparison

Social norms can influence behavior, but it is not yet fully clear why and how they have an influence. Little research has been done on this topic, since it is difficult to measure. Indeed, from the energy conservation study of Nolan and colleagues it appeared that people are not aware of the influence their peers have on their behavior (2008). This means that asking people directly why social norms influence their behavior will not always lead to true reasons for the effect of social norms, as they do not realize the influence social norms have. Nevertheless, there are theories about the possible explaining processes for the influence of social norms on behavior and also neuroscientific research gives insights in this.

One explanation is provided by the social comparison theory of Festinger (1954), which explains that people want to evaluate their own opinions and abilities and do this by comparing themselves to others. This comparison happens in situations when no objective and non-social means are available. For example, when alternative products are offered during online grocery shopping, customers cannot test the taste of the foods. Despite that, they can instead look at what similar others buy to evaluate their own shopping basket and to determine if this is correct. Two types of comparisons can occur. Evaluating oneself in comparison to someone superior is called

upward social comparison and can cause need for self-improvement. On the contrary, downward social comparison is comparing oneself to someone inferior and can boost the self-esteem (Festinger, 1954; Wills, 1981). For the current research, the goal is to let customers that do not yet choose for healthy products make a healthier choice. The feedback is accompanied with healthier suggestions and this implies that healthy products are 'the better choice' in this case, which means people will make an upward social comparison.

2.2.1 Motivations to act conform social norms: affiliation and accuracy

After having compared oneself to others, what is then the trigger for behaving similar to others? Deutsch and Gerard (1955) distinguished between two types of motivations for acting in accordance with the social norm. Conforming to the social norm because you want to belong to the group is called normative conformity. The motivation behind this is defined by Cialdini and Goldstein (2004) as the goal of affiliation. That is, humans have the inherent social need to belong to others and maintain relationships (Baumeister & Leary, 1995; McClelland, 1987; Stevens & Fiske, 1995). This can be linked to conforming to injunctive norms, because the implicit idea behind those norms is that others will approve of us, too, if we behave in a way that others approve (Cialdini & Goldstein, 2004). Jacobson, Mortensen and Cialdini (2011) examined to which extent norms are cognitively associated with the goal of affiliation with an experiment. 87 participants had to perform a lexical decision task, which is a procedure that measures how fast people classify certain words. The goal of the study of Jacobson and colleagues was to discover what cognitive associations people have between norms and the goal of affiliation/social approval. Word primes were either neutral nonsocial words, injunctive social words (e.g., responsibility, should, ought, duty) or descriptive social words (e.g. typical, usual, popular, widespread). First, one of the prime words was shown to the participant for 35 milliseconds. Second, the participant got to see a word until he indicated whether this was a meaningful English word. The words were either related to the goal of social approval or non-words. When the social approval words had been preceded by an injunctive prime, participants appeared to respond significantly quicker than when the words had been preceded by a neutral prime. The descriptive primes appeared to cause a slower response to social approval words than the neutral prime did. This shows that injunctive information is associated with the goal of social approval/affiliation, whereas descriptive norms are not related to this goal that causes normative conformity.

The second explanation of Deutsch and Gerard is that you conform to the social norm because you want to act correctly, called informational conformity. Cialdini and Goldstein mention this motivation as the goal of accuracy. It occurs because consumers think: 'if a lot of people behave in this way, it must be right' (Cialdini 1987, Cialdini & Goldstein 2004, Jacobson et al., 2011). The goal of accuracy can be explained as the goal of humans "to achieve their goals in the most effective and rewarding manner possible" (Cialdini & Goldstein, 2004, p. 2). Using the information of what others do as a guide for their own behavior saves consumers both time and effort as they do not have to look for information on how to behave themselves. This relates to descriptive norms as did also appear from the lexical decision experiment described in the section on the goal of affiliation (Jacobson et al., 2011). In addition to the words related to the goal of social approval and the non-words, also words related to the goal of accuracy/efficiency were used in the experiment (e.g., beneficial, efficient, desire, accurate). Those latter words preceded by descriptive or injunctive primes both led to significantly quicker responses compared to

neutral primes, showing that both types of norms are related to the goal of accuracy. So, when people compare themselves to others and notice that others behave differently, a reason to change their behavior is that what others do seems right to them.

2.2.2 Neuroscientific motivations: reward and punishment

Also, neuroscientific research can help in discovering why people conform to social norms. It appears that this process is mediated by signals in the brain that are associated with emotion and reward. A study has been done in which participants received information about the popularity of symbols. Brain activity was then assessed while people were exposed again to the popular and unpopular symbols. This research shows that a region in the brain which is involved in experiencing reward displayed greater activity to symbols that were told to be popular to participants than to symbols that were told to be unpopular (Mason, Dyer & Norton, 2009).

Another study that investigated brain activity let participants first choose between perceptual illusions, in which they could see two possible figures (Stallen, Smidts & Sanfey, 2013). After this, all participants were told that they focused on the foreground of the illusions and were therefore a foreground perceiver, in contrast to people that focused on the background or to people that could not be categorized this way. Next, participants had to do an estimation task consisting of 214 trials while undergoing functional magnetic resonance imaging (fMRI). After their own estimation, they got to see an estimation of either a foreground perceiver (an in-group member) or an out-group member. Again, participants were asked to indicate their estimate. From the following questionnaire it appeared that participants had a higher level of identification with, greater trust in and more positive associations with in-group members than with out-group members. As expected, conformity to the estimates of an in-group member was higher than to an out-group member, showing social influence. It appeared that activity in a certain region in the brain, the striatum, was selectively enhanced when participants conformed to the social group they were in. Since the striatum plays a primary role in the processing of rewards, this suggests that conformity occurs because peer groups are more strongly associated with experiencing affect and reward.

Similar conclusions can be made from the fMRI research of Nook and Zaki (2015) on neural responses to foods. Participants first indicated how much they would like to eat 150 foods on a scale from 1 to 8. Right after each rating they were shown the social norm, presented as a red box around a number on the scale where their own rating was indicated with a blue box. Five minutes after this, the participants rated the 150 foods again. The social norm condition caused a significant shift of responses towards the norm. The results of the fMRI showed that agreement of participants with the social norm led to increased activity in regions of the brain associated with reward processing compared to disagreement with the norm. Disagreement has also been shown to trigger neural responses in regions of the brain that are active when processing error and punishment (Klucharev, Hytönen, Rijpkema, Smidts, & Fernández, 2009).

Taking the insights of these neuroscientific studies together, it can be concluded that feelings of reward arise in the brain when people conform and feelings of punishment when people do not conform to social norms. As feelings of reward are pleasurable and feelings of punishment are not, this might work reinforcing for the effect of social norms (Klucharev et al., 2009).

2.3 Feedback on sugar content

The normative feedback in this study will consist of feedback on the sugar content of chosen food products compared to other people. The influence of such social feedback is discussed above and now it is important to discover how consumers respond specifically to feedback concerning the sugar content of food products. Making people aware of the amount of sugars in their groceries can cause different responses in behavior. It appears from research on dietary intake that people do not report accurately what they usually eat (Black et al. 1993; Livingstone et al. 1990; Prentice et al., 1986). Around 75% of the people under-report their daily energy intake with 25% (Rennie, Coward & Jebb, 2007). A different study on the effect of personalized behavioral feedback shows that making people aware of their underestimation leads to a positive change in behavior (Wohl, Davis, & Hollingshead, 2017). The study on gambling revealed that personalized feedback about gambling expenditures helped people that tend to underestimate their expenditures to spend significantly less on gambling. In food choice, the same effect could occur after discovering that products contain more sugar than expected and lead to a change in product choice in order to reduce energy intake, strengthening the effect of the social comparison.

Now, even though calorie information is provided on food packages, many people do not pay attention to it. Front-of-pack nutrition labels are used to make the information more easily accessible to consumers. Nevertheless, there are still many consumers that do not watch this information since foods are typical low involvement products (Van Kleef & Dagevos, 2015). There is often little time for consumers to extensively look for information and they are also distracted by environmental factors. Therefore, making the nutrition information focal by the use of normative feedback at the point of purchase can possibly help consumers in choosing healthier products.

As studies that have been performed to evaluate the impact of restaurant menu labeling of food choice also make the nutrition information stand out, they are comparable to providing nutritional information clearly to online grocery shoppers. A study on this topic revealed that participants who received a menu with calorie information ordered meals containing 14% fewer calories than participants who received a menu without calorie information (Roberto, Larsen, Agnew, Baik, & Brownell, 2010). The participants (n=303) did randomly receive either a menu without calorie information, a menu with calorie labels or a menu with both calorie labels and information on the recommended daily caloric intake.

Another experiment that has been done is similar to online grocery shopping in the current study. Balfour, Moody, Wise and Brown (1996) made use of a computer system where customers in a worksite could choose their meal. The customers did receive graphical nutritional feedback on their choice and were offered to change their initial meal selection. 16% of the customers did change their initial choice to a healthier choice in the study, which shows that nutritional feedback can be used to let consumers choose healthier food products. It is possible that this effect would be somewhat smaller now, because nowadays people are used more to ordering from a screen than they were in 1996, causing them to pay less attention to all information given and clicking faster to continue to the next step. On the other hand, the effect is possibly bigger in an online shopping environment compared to a cafeteria setting. In choices made for the future people tend to take long term goals such as healthiness into account, whereas in choices for the immediate future more weight is given to the immediate rewards of eating snacks for example (Huyghe, Verstraeten, Geuens, & Van Kerckhove, 2016). Since groceries ordered online cannot be

eaten right away, but will only arrive in the following days, nutrition information will have a bigger influence online.

Concluding, nutrition information alone can have a positive influence on healthy food choices, when made focal to customers as was done in the experiment of Balfour and colleagues (1996). When social normative feedback is given on nutrition content, people are confronted with their actual energy intake and this can strengthen the social upward comparison that people make due to the social norm when the information provided is credible.

3. Conceptual framework and hypotheses

Taking previous research in the field of social norms together, one main effect is expected of the influence of social normative feedback on the initial choice of online food products. Descriptive norms have been shown to be effective in changing behavior in various studies, when the norm is made focal (Kallgren et al., 2000; Van Herpen et al., 2016). Social normative feedback has been found to be able to let people make healthier food choices in different offline settings (Cruwys et al., 2015; Robinson et al., 2014). Therefore, and because social norms have shown their influence on other types of online shopping behavior already (Demarque et al., 2015; Duan et al., 2009; Tucker & Zhang, 2011), it is expected that this effect will also be achieved in an online grocery shopping environment. The fact that the feedback is about sugar content can strengthen this influence, since it has been found that (non-social) feedback on sugar content has a positive influence on healthy (online) food choices (Balfour et al., 1996; Roberto et al., 2010). The effectiveness of the social normative feedback will be compared to a more traditional kind of feedback, namely that of an external source: the Dutch Nutrition Centre (het Voedingscentrum). It is expected that the normative feedback will be most effective in changing the initial product choice of people, because of the process through which descriptive social norms work, further elaborated on below. Based on this information, the following main hypothesis is formulated:

H1. Social normative feedback on sugar content increases the likelihood that online grocery shoppers change their initial product choice to a healthier food choice more than feedback of the Dutch Nutrition Centre or no feedback does.

As described in the theoretical framework, the social normative feedback leads to a comparison of oneself to others (Festinger, 1954). In this study the goal is to let customers that do not yet choose for healthy food products make a healthier choice. Therefore, social normative feedback on sugar content is only provided to those who perform worse than the healthy descriptive norm of a low sugar content, leading to an upward social comparison. Feedback from the Nutrition Centre and no feedback are less likely to elicit comparison to others, because behaviour of others is not mentioned. This leads to the following hypothesis:

H2. Compared to Dutch Nutrition Centre feedback or no feedback on sugar consumption, social normative feedback on sugar consumption (with higher norm) will lead to a higher tendency to compare oneself to sugar consumption of others (upward social comparison).

This upward social comparison can in turn lead to different responses. The lexical decision experiment of Jacobson and colleagues (2011) showed that descriptive norms are related to the goal of accuracy and not to the goal of affiliation. So, a norm about what others do can guide people to what is the right thing to do and can make them feel like they are doing wrong. Other response that can evoke through social comparison are derived from neuroscientific research, namely feelings of reward and of punishment (Klucharev et al., 2009; Mason et al., 2009; Nook & Zaki, 2015; Stallen et al., 2013). Feelings of error and punishment will arise when making an upward social comparison, as people discover they deviate from the norm (Klucharev et al., 2009). The following hypotheses are formulated:

H3a. The higher the comparison of oneself to lower sugar consumption of others (upward social comparison), the higher feelings of inaccuracy will be.

H3b. The higher the comparison of oneself to lower sugar consumption of others (upward social comparison), the higher feelings of punishment will be.

Next, both feelings of inaccuracy and feelings of punishment and error can make people revise their choice, in order to feel like acting correct and experience feelings of reward, respectively. This is derived from the research of Cialdini and Goldstein (2004) and of Deutsch and Gerard (1955), stating that people conform to the norm because of their goal of doing things right, the 'goal of accuracy'. Since deviating from the norm leads to a feeling of punishment and error and conforming to the norm leads to increased activity in regions of the brain related to reward processing (Klucharev et al., 2009; Mason et al., 2009; Nook & Zaki, 2015; Stallen et al., 2013), this is likely to be a motivation for people to revise their initial product choice.

H4a. The higher the feelings of inaccuracy, the more likely it is that the consumer revises his initial choice to a healthier choice.

H4b. The higher the feelings of punishment and error, the more likely it is that the consumer revises his initial choice to a healthier choice.

The feedback can also have a negative effect on revision of choice, through psychological reactance (Dillard & Shen, 2005). This is possible to occur for all types of feedback, since it appeared that recommendation services can cause reactance (Fitzsimons & Lehmann, 2004; Lee & Lee, 2009). When a supermarket interferes with their personal choices consumers might feel like their freedom is threatened, which causes irritation and sometimes even the willingness to act opposite to the proposed behaviour. It is likely that feedback from the Nutrition Centre elicits most reactance, as telling people from an external source how they should behave would feel more as a threat of freedom and cause irritation more than providing them information about how others behave. This leads to the following hypotheses:

H5 Compared to normative feedback or no feedback, Dutch Nutrition Centre feedback will lead to more reactance.

H6 The higher the reactance a consumer experiences after receiving feedback and/or product suggestions, the less likely it is that the consumer revises his initial choice to a healthier choice.

The process of influencing the food choice of online grocery shoppers through social normative feedback to a healthier choice described here, is shown in the following conceptual framework:

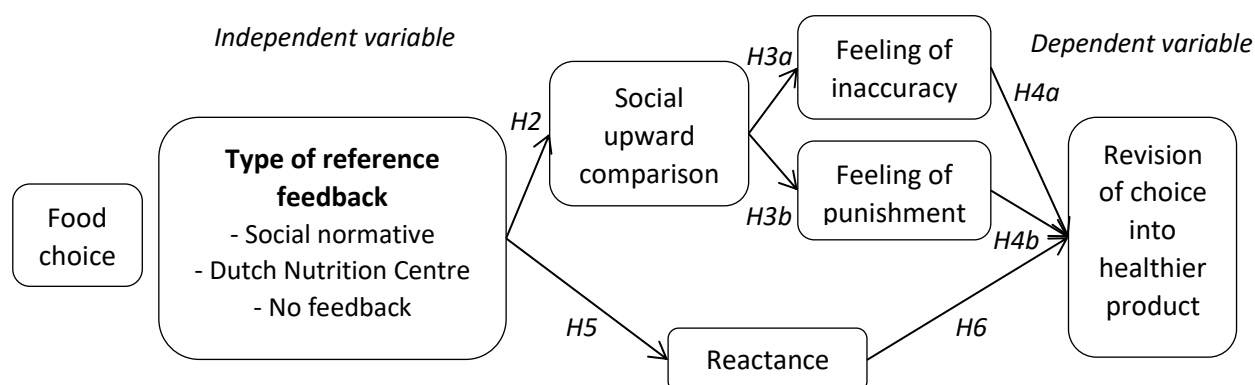


Figure 1: Conceptual framework

4. Methods

An online experiment was conducted to discover what influence social normative feedback on sugar content has on food choices. Participants were instructed to order one product from a product selection of snack biscuits (*tussendoortjes*). Social normative feedback was given after the product choice was made, only to the participants that chose one of the unhealthy snack biscuits. In this way, feedback on the initial choice of participants could be given and participants could change their order.

4.1. Study design

The study included three conditions, which were tested between subjects. Only participants that initially chose an unhealthy product were divided among the conditions, as the feedback can only be effective for participants that have not chosen for healthy products initially. The first condition was the condition in which participants received the social normative feedback on their unhealthy product choice. To find out the difference between social normative feedback and feedback from a, more traditional, external source, participants in the second condition received (manipulated) feedback from the Dutch Nutrition Centre (het Voedingscentrum). The Dutch Nutrition Centre was chosen as an external expert source, because this is a generally better known source in the Netherlands than the WHO. The third condition was a control condition, in which no feedback was given. In all three conditions two alternative product suggestions, containing less sugar than the initially chosen product, were presented to the participants.

4.2. Subjects

Dutch participants were recruited through an online consumer panel, Facebook and LinkedIn. A total of 386 people completed the questionnaire, of which 162 made a healthy product choice initially and the other 224 participants that made an unhealthy product choice were randomly assigned to one of the three conditions. The division of participants among the conditions is found in Table 1 and Table 2 shows summary of the demographic characteristics of all participants.

Initial healthy choice	Descriptive norm	Nutrition Centre	No feedback
162	69	77	78

Table 1: Number of participants per condition

		N	%
Gender	Male	84	22%
	Female	302	78%
Age	18-24	202	52%
	25-34	61	16%
	35-44	11	3%
	45-54	40	10%
	55-64	43	11%
	65 or older	29	8%
Education	Low/middle	58	15%
	High	328	85%

Table 2: Demographic characteristics of participants

4.3. Procedure

First, questions concerning demographic characteristics of the participants were asked. Next, the participants were instructed to go grocery shopping and choose one product they would like to buy from each of the three pages with products. The first screen contained detergents, the second screen contained the snack biscuit products that are actually used for the study and the third one contained pasta products. The detergents and pasta products were not used for the purpose of this study, but to make the shopping experience of the participants more realistic and again to distract from the actual goal of the study.

Next, the products that the participants had chosen, were shown to them in their online shopping basket. At this moment the intervention took place. Participants that made a healthy choice already were skipped to the end of the survey. So, either social normative feedback, feedback from the Dutch Nutrition Centre or no feedback was shown to the remaining participants, all accompanied by two alternative products containing less sugar than the initial product choice. Participants had the option to change their initial choice.

Participants were thanked for their order and explained that a few more questions would be asked about the choices they made. Questions concerning social upward comparison, the feeling of accuracy, the feeling of punishment, reactance, feeling of reward and credibility of the feedback were asked while participants had to think back to the moment of the intervention.

The survey ended with a message in which the participants are thanked for their participation and there was room for the participants to leave comments concerning the study.

4.3.1 Feedback

The feedback in the normative feedback condition and in the condition of the Dutch Nutrition Centre consists of a textual and graphical part. In the first condition the descriptive norm told the participant that peers of their age buy products containing less sugar than they do ('Other customers aged 24 buy snack biscuits that contain less sugar'). Age was chosen as a reference group, because it is a group that actual supermarkets might know about and was feasible to personalize in this study. The feedback on sugar content was graphically presented to the participant as the figure on the following page shows. The amount of sugar that was presented as sugar content of cookies that others buy is actually the sugar content of the healthier alternative cookies. 'Try one of these products with less sugar' was shown above the two alternative product suggestions, which can be seen in Figure 2 on the following page.

In the second condition the manipulated feedback of the Dutch Nutrition Centre was presented as: 'The Dutch Nutrition Centre (Voedingscentrum) advices to buy food products that contain less sugar'. Again, the feedback on sugar content was graphically presented to the participant. The amount that was presented as the recommendation of the Dutch Nutrition Centre is the same as the amount that was presented as the sugar content of others in the first condition, to make sure differences in choice between conditions are caused by the source of the feedback and not because of a bigger or smaller difference in sugar content. Again, 'Try one of these products with less sugar' was shown above the two alternative product suggestions.

In the control condition no feedback was provided along with the product suggestions. The text shown above these two products is 'Try one of these products'.

Other customers of 23 years old buy cookies that contain less sugar.

Try one of these products with less sugar:

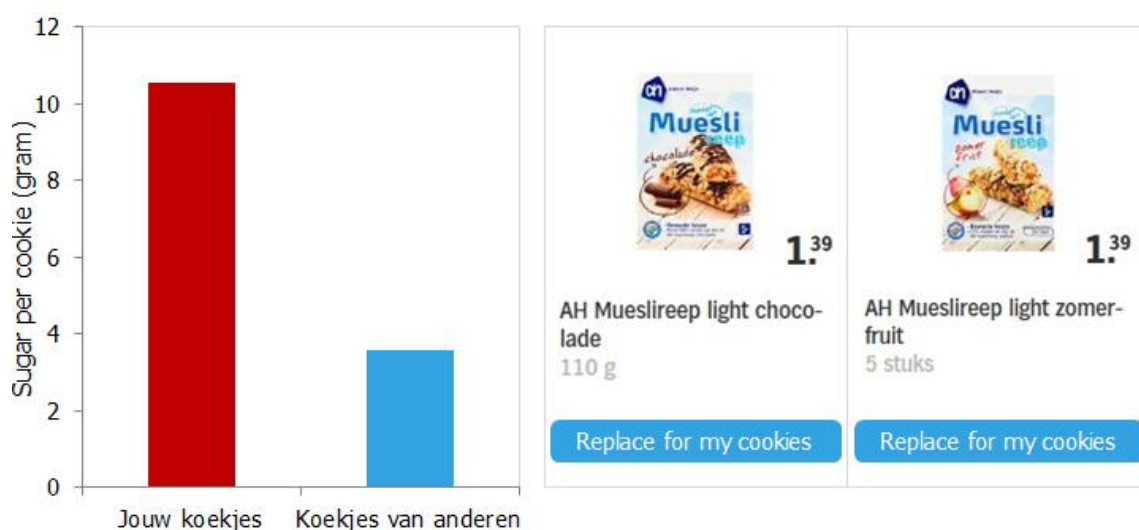


Figure 2: Feedback on sugar content for the social normative feedback condition

4.3.2 Products

The assortment of snack biscuits consisted of ten different products in this study. A selection criterion for the products was that for each product a similar, more healthy option was available. These latter five healthier options were also used as alternative product suggestions. The two product suggestions shown at the intervention were similar to the initially chosen product.

4.4. Measures

The key dependent variable is the change in products ordered before and after the intervention. This will concern both whether participants change or stick to their initial choice as well as the sugar reduction this revised choice leads to.

The measurement scales used in this research are partly adapted from literature to fit this research study and where no existing scales were available, new scales are used. All items are measured on a 7-point likert scale ranging from 1 = I disagree strongly to 7= I agree strongly. In table 3, all items and the reliability of the scales are shown. When necessary, explanation for some of the constructs is given below the table.

	Cronbach's α
Social upward comparison	.894
<i>The moment I saw the page with my groceries:</i>	
I compared the amount of sugar in the snack biscuits of my choice with that of others	
I thought about the amount of sugar in the snack biscuits of my choice compared with that of others	
I judged the amount of sugar in the snack biscuits of my choice relative to that of others	
Feeling of inaccuracy	.821
<i>The moment I saw the page with my groceries:</i>	
I got the feeling the amount of sugar in the snack biscuits of my choice is too much	
I realized the amount of sugar in the snack biscuits of my choice could have been better	
I knew the amount of sugar in the snack biscuits of my choice is not right	
Feeling of punishment	.902
<i>Seeing the page with my groceries:</i>	
Gave an unpleasant feeling about the amount of sugar in my snack biscuits	
Caused a bad feeling about the amount of sugar in my snack biscuits	
Felt like a bad rating about the amount of sugar in my snack biscuits	
Motivation to change behavior: reward	.931
<i>Making the choice to buy different snack biscuits:</i>	
Gave me a good feeling	
Caused me to get a pleasant feeling	
Released a happy feeling for me	
Reactance	
Irritation	
<i>The feedback of the online supermarket on my product choice made me feel:/</i>	.878
<i>The product suggestions that were shown to me by the online supermarket made me feel:</i>	.873
Irritated	
Angry	
Annoyed	
Willing to eat extra sugar	
<i>The feedback of the online supermarket on my product choice made me:/</i>	.740
<i>The product suggestions that were shown to me by the online supermarket made me:</i>	.816
Just not want to eat less sugar	
Just want to eat extra sugar	
Just want to eat unhealthier	
Perceived threat of freedom	
<i>By giving feedback on my product choice, the online supermarket tried to:/</i>	.844
<i>By showing product suggestions, the online supermarket tried to:</i>	.891
Threaten my freedom to choose	
Make a decision for me	
Tried to manipulate me	
Tried to pressure me	

	Cronbach's α
Credibility of feedback	-
<i>The following items are used to measure this:</i>	
The graph shown on the page with my groceries was credible	
The information given on the page with my groceries was credible	
Appreciation of advice and feedback	-
<i>I would like it if:</i>	
I get advice to make healthier product choices	
I receive feedback on my product choices	
Dieting status	.874
I eat less than usual after weight gain	
I reject food or drinks because of worry about weight	
I eat less during meal times	
I watch what I eat	
I eat foods that are slimming	
I eat less after eating too much	
I eat less deliberately	
I do not eat because I am watching my weight	
I try not to eat in the evening because I am watching weight	
I take into account weight when I eat	

Table 3: Measurement scales and reliability

Reactance was measured through three constructs adapted from Dillard and Shen (2005): irritation, willingness to eat more sugar and threat of freedom. Irritation was measured on a 5-point likert scale ranging from 1= none of this feeling to 5= a great deal of this feeling. Extra positive items were added to each of these scales to not steer participants into a negative direction by the way the questions were asked. These answers to the positive items were not included in the analyses of the results. The questions about the feedback were only asked to participants in one of the feedback conditions and the questions concerning the suggestions were asked to participants in all conditions, as also the control condition contained product suggestions.

Credibility of both the textual and graphical feedback is checked for the social normative feedback as well as the external source condition. In addition to the results of the actual change participants did or did not make, appreciation of advice on healthy product choices and feedback about product choices were asked.

The product selection in this study was small and it was possible that participants would never eat or buy the cookies they chose in this study. Frequent eaters or buyers of the cookies could be less willing to change their choice than participants that chose these cookies only for the current study. To control for significant differences between groups, the eating and buying frequency of the snack biscuits and of online grocery shopping were asked for, ranging from 1 = 'never' to 4 = 'at least once a week'. It is possible that people that are dieting more often change their choice after receiving feedback since they want to eat healthy. So, dieting status was measured to control for significant between-group differences. It was measured on a 5-point likert scale (1= never, 5=

very often) through the use of 10 items related to restrained eating from the Dutch Eating Behavior Questionnaire (Van Strien, Frijters, Bergers & Defares, 1986).

The complete questionnaire can be found in Appendix A: Complete questionnaire and the interventions for each condition that were shown to participants depending on their product choice are presented in Appendix B: Overview interventions per product per condition

4.5. Data analysis

First, randomization was tested, to check if there are no significant differences in demographic characteristics between conditions. A Pearson Chi-Square test was used for gender and educational level, and a one-way ANOVA for age, dieting status, appreciation of advice and feedback, online grocery shopping frequency and credibility of feedback. Reliability analyses were done to check the consistency of the scales used for measurement of social comparison, feeling of inaccuracy, feeling of punishment, feeling of reward and reactance.

A Pearson Chi-Square test and logistic regression are carried out to discover how big the influence of the different feedback conditions is on the revision of the initial product choice to a healthier food choice and if the social normative feedback has the biggest influence, which was hypothesis one. Hypothesis two is tested with a one-way ANOVA to discover if the conditions differ significantly in the extent to which social comparison occurs. Next, post hoc tests show which conditions are significantly different from each other. Hypothesis 3a and hypothesis 3b stated that higher social comparison leads to higher feelings of inaccuracy and higher feelings of punishment, respectively. To test this, a regression of social comparison on feelings of inaccuracy and feelings of punishment is done with the use multivariate regression. Additionally, a bivariate Pearson correlation is carried out to find out what the effect size of the correlation between social comparison and the separate independent variables is. Logistic regression is used to test whether higher feelings of inaccuracy and of punishment increase the likelihood of revision of choice, which is hypothesis four. Through the use of PROCESS a simple mediation analysis was carried out to find out if feelings of inaccuracy and feelings of punishment mediate the relationship between social comparison and revision of choice. Hypothesis five stated that feedback from the Dutch Nutrition Centre would lead to higher reactance than the other conditions would. First the means of reactance concerning feedback from the Nutrition Centre and normative feedback are compared through an independent t-test. Then the means of reactance due to the suggestions offered in all conditions are compared with a one-way ANOVA. Next, point-biserial correlation is performed to find out if hypothesis six, whether revision of choice is dependent of reactance due to feedback and due to suggestions, can be accepted. To discover how big this relationship is, logistic regression is used. Additionally, differences between the conditions in feeling of reward after participants have revised their choice are analyzed with a one-way ANOVA. For analysis of the appreciation of advice and feedback, an independent t-test is used to compare the means between people that initially chose healthy and those who chose unhealthy as well as to discover differences between people that did and did not revise their initial choice.

All statistical analyses were done with IBM SPSS Statistics 23. A significance level of $p < .05$ is used.

5. Results

5.1. Descriptive statistics

The randomization checks are done for the 224 participants that chose unhealthy cookies and were thus divided over the three conditions. There were 56 men and 168 women and their age ranged from 18 to 86 years ($M = 34.8$, $SD = 18.0$). Most participants were highly educated: 188 and 36 were low/middle educated. The mean dieting status was 2.39 ($SD = .72$), indicating that participants are on average sometimes dieting.

There are no differences in gender ($\chi^2(2) = 0.703$, $p = .704$), educational level ($\chi^2(2) = 0.066$, $p = .968$), age ($F(2, 221) = 0.430$, $p = .651$), dieting status ($F(2, 221) = 0.038$, $p = .963$), appreciation of advice ($F(2, 221) = 0.678$, $p = .509$) and appreciation of feedback ($F(2, 221) = 1.124$, $p = .327$) between the conditions. Levene's test shows that the variances for frequency of online grocery shopping are significantly different ($F(2, 221) = 4.529$, $p = .012$). Therefore, Welch's F is calculated and shows no significant differences between the conditions in frequency of online grocery shopping ($F(2, 144.62) = 0.940$, $p = .393$). This means that the randomization was successful.

The mean credibility of both the graphical and textual feedback can be found in the Figure 3. The credibility of the graph is not significantly different for the different feedback conditions ($F(1, 144) = .973$, $p = .326$), but the credibility of the information is significantly higher in the condition of feedback of the Nutrition Centre compared to the normative feedback condition ($F(1, 137.70) = 25.03$, $p < .001$).

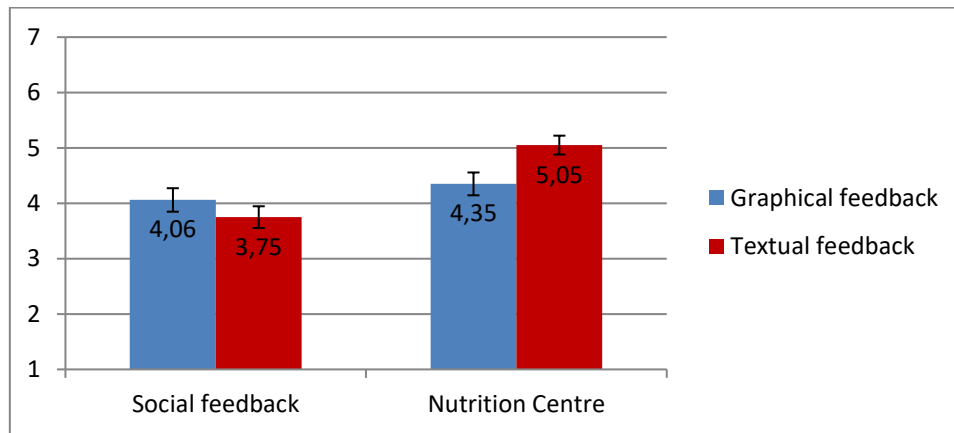


Figure 3: Mean scores and standard error values for credibility of feedback per condition

5.2. Hypothesis 1: influence of type of feedback on revision of choice

Figure 4 shows that the percentage of participants that revised their unhealthy choice to a healthy choice after the intervention differed among the conditions. In the descriptive norm condition, 28 out of 69 participants changed their initial choice, for the Nutrition Centre condition this were 44 out of 77 participants and in the control condition only 11 out of 78 participants changed their initial choice. Pearson's Chi-square reveals that the differences between the conditions are highly significant ($\chi^2(2) = 31.307$, $p < .001$).

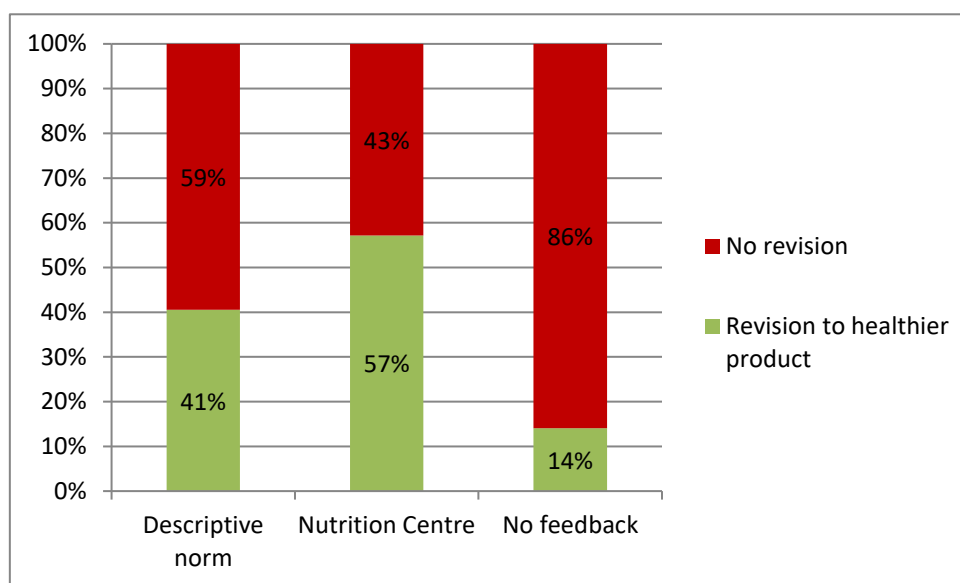


Figure 4: Percentage of participants that revised their initial choice per condition

The influence of the different types of feedback on the revision of choice is tested with logistic regression. Adding the different types of feedback to the model, improves the initial model. This is highly significant, with $\chi^2(2) = 33.517$, $p < .001$. The Wald statistic shows that the b -coefficients are significantly different from 0 for the feedback from the Nutrition Centre ($p < .001$) as well as for the social normative feedback ($p < .001$). This means that the type of feedback is a significant predictor of whether participants revise their initial choice or not. Nagelkerke's R^2 is .190. The odds ratio Exp (B) indicates that when someone receives social normative feedback, the chance is 4.160 times bigger that the person revises his choice compared to people receiving no feedback. For the condition with feedback from the Nutrition Centre the odds ratio is bigger than for the descriptive norm condition, with $OR = 8.121$ ($H1$ is rejected). The coefficients of the model predicting whether someone would revise his choice are shown in the table below.

Predictor	95% CI for Odds Ratio				
	B (SE)	Lower	Odds Ratio	Upper	p- value
Constant	-1.81 (.33)	-	0.16	-	< .001
Feedback Nutrition Centre	1.43 (.41)	1.87	4.16	9.24	< .001
Social normative feedback	2.09 (.40)	3.72	8.12	17.74	< .001

Table 4: Coefficients of the model predicting revision of choice

5.3. Hypothesis 2: influence of type of feedback on social comparison

A statistically significant difference between the conditions in social comparison was determined by one-way ANOVA ($F(2, 221) = 3.245, p = .041$). The Levene's statistic is 3.431 ($p = .034$), showing that the assumption of homogeneity of variance is violated. Therefore, a Games-Howell post hoc test is used to determine what conditions significantly differ from each other. This test reveals that feedback of the Nutrition Centre lead to significantly higher social comparison compared to no feedback ($p = .031$), but no significant difference was found between the social normative feedback and feedback of the Nutrition Centre ($p = .712$) or no feedback ($p = .231$) (H2 is rejected). The following graph shows the mean values of social comparison for each condition (1 = no social comparison, 7 = high social comparison).

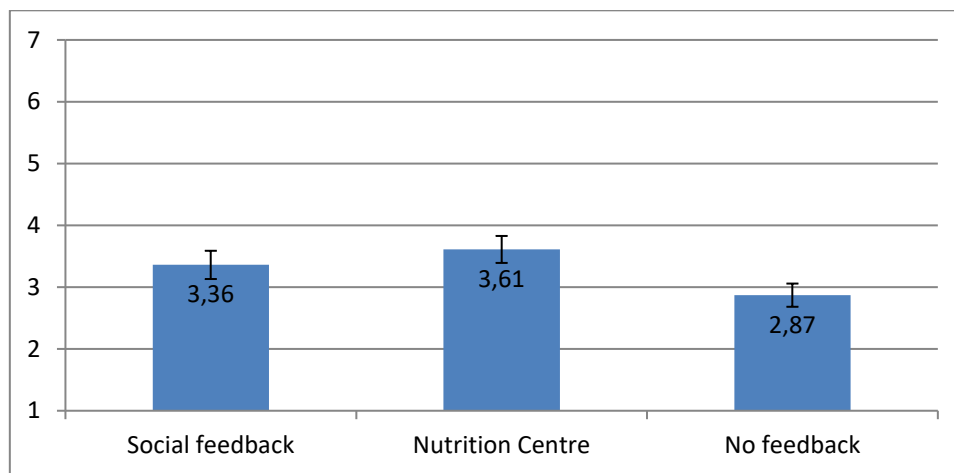


Figure 5: Mean scores and standard error values for upward social comparison per condition

5.4. Hypotheses 3a & 3b: higher feelings of inaccuracy and punishment due to higher social upward comparison

A multivariate regression reveals a significant correlation between social upward comparison and feelings of inaccuracy and feelings of punishment $F(2, 221) = 28.40, p < .0001$; Wilk's $\Lambda = 0.796$, partial $\eta^2 = .20$.

The correlations between social upward comparison and feelings of inaccuracy and feelings of punishment are shown in the following table. There is a significant positive correlation between both social upward comparison and feelings of inaccuracy and between social upward comparison and feelings of punishment (H3a and H3b can be accepted). The effect sizes for feelings of inaccuracy and feelings of punishment shown in the table below are medium.

		Feelings of inaccuracy	Feelings of punishment
Social comparison	Pearson correlation	.411	.396
	p-value	< .001	< .001

Table 5: Correlations between social comparison and feelings of inaccuracy and punishment (n = 224)

5.5. Hypotheses 4a & 4b: influence of feelings of inaccuracy and of feelings of punishment on revision of choice

The influence of feelings of inaccuracy and the influence of feelings of punishment on the revision of choice are tested with logistic regression. A highly significant improvement is made to the null model by adding feelings of inaccuracy and punishment to the model, with $\chi^2(2) = 27.533$, $p < .001$. The Wald statistic shows that feelings of inaccuracy and punishment are significant predictors of whether participants revise their initial choice, as the b -coefficients are significantly different from zero for both feelings of inaccuracy and feelings of punishment. Nagelkerke's R^2 is .158 and the Hosmer and Lemeshow test is non-significant ($\chi^2(8) = 7.433$, $p = .491$), which means that the data fits the model well. The chance that someone revises his choice is 1.370 times bigger for each unit the feelings of inaccuracy increase and 1.245 times bigger for each unit the feelings of punishment increase (H4a and H4b are supported). The table below shows the coefficients of the model predicting whether someone would revise his choice.

Predictor	B (SE)	95% CI for Odds Ratio				p -value
		Lower	Odds ratio	Upper		
Constant	-2.72 (.50)	-	0.07	-		< 0.001
Feelings of inaccuracy	0.32 (.12)	1.09	1.37	1.73		.008
Feelings of punishment	0.22 (.11)	1.01	1.25	1.53		.037

Table 6: Coefficients of the model predicting revision of choice

Simple mediation analysis was conducted to test the relationship between social comparison and revision of choice, with feelings of inaccuracy and feelings of punishment as possible mediators as shown in the figure below. The bootstrap confidence interval does not contain a value of 0 for the feelings of inaccuracy, the feelings of punishment and the total indirect effect. This means that the separate indirect effects of feelings of inaccuracy and feelings of punishment and the total indirect effect are significant at a 0.05 significance level, respectively $b = .105$, BCa CI [0.021, 0.217]; $b = .072$, BCa CI [0.001, 0.161] and $b = .177$, BCa CI [0.087, 0.298].

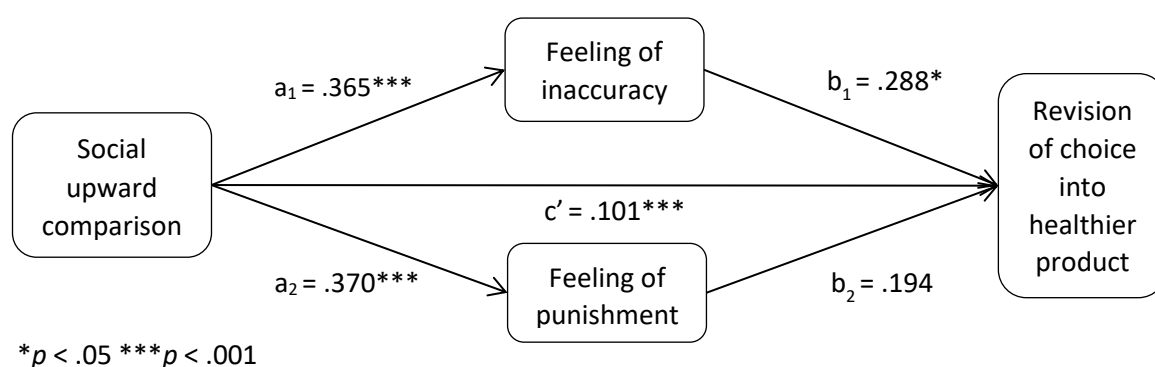


Figure 6: Mediation model

5.6. Hypothesis 5: influence of type of feedback on reactance

The overall average scores on irritation, willingness to eat more sugar and perceived threat of freedom due to the feedback and the suggestions can be found in Figure 7. An independent t-test reveals that the differences between the normative feedback and Nutrition Centre condition for irritation ($t(144) = 1.528, p = .129$), willingness to eat more sugar ($t(144) = -0.377, p = .707$) and perceived threat of freedom ($t(144) = 0.504, p = .615$) due to the feedback offered are non-significant. With a one-way ANOVA also no significant differences between the conditions were found between the irritation ($F(2, 142.22) = 1.995, p = .140$), willingness to eat more sugar ($F(2, 221) = 0.998, p = .370$) and perceived threat of freedom ($F(2, 221) = 1.281, p = .280$) due to the suggestions offered (H5 is rejected).

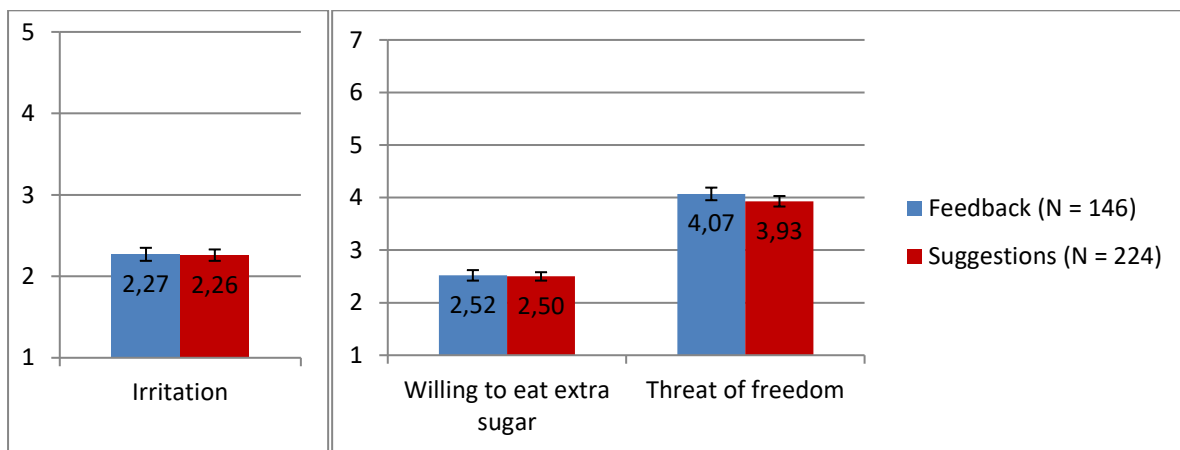


Figure 7: Mean scores and standard error values for reactance caused by feedback and suggestions

5.7. Hypothesis 6: influence of reactance on revision of choice

Point-biserial correlation is performed to find out if revision of choice is dependent of reactance due to feedback and due to suggestions, of which the results are shown in table 7. Irritation as well as willingness to eat more sugar due to feedback and due to suggestions is significantly negatively correlated with revision of choice, threat of freedom is not (H6 is partly accepted). Logistic regression is carried out to discover how big the influences on revision of choice are. The relation between irritation due to feedback is negative, as irritation has a significant negative relation with revision of choice ($b = -.0524, p = .003$). The effect is small, as Nagelkerke's $R^2 = .083$. The odds ratio is 0.592. For irritation due to suggestions the logistic regression results in the exact same pseudo R^2 $b = -.0568$ ($p < .001$) and the odds ratio is 0.566.

	Scale	r_{pb}	p -value
Feedback (N = 146)	Irritation	-.25	.002
	Willing to eat extra sugar	-.21	.010
	Threat of freedom	-.04	.667
Suggestions (N = 224)	Irritation	-.24	< .001
	Willing to eat extra sugar	-.22	.001
	Threat of freedom	-.05	.447

Table 7: Point biserial correlation coefficients for revision of choice and reactance scales

5.8. Additional tests

In addition to the analyses that were carried to test the conceptual model, more analyses were done to discover if revision of choice led to feelings of reward and if advice and feedback would actually be appreciated. The results are described below.

5.8.1. Feeling of reward

Participants that revised their choice scored on average 4.18 ($SD = 1.41$) on the feeling of reward scale, which means that changing their initial choice did neither make participants feel good, neither did it not give them good feelings. The mean for participants in the condition of a descriptive norm is 3.82 ($SD = 1.76$), of the Nutrition Centre $M = 4.31$ ($SD = 1.28$) and of no feedback $M = 4.51$ ($SD = 0.70$). To discover if the differences between the conditions are significant, a one-way ANOVA is done. Levene's test reveals however that equality of variances is violated ($F(2, 79) = 4.815, p = .011$). The Welch's test shows that there are no significant differences between the conditions ($F(2, 36.88) = 1.460, p = .245$).

5.8.2. Appreciation advice and feedback

All 386 participants were asked how much they would appreciate advice on healthy product choices and feedback about their product choices. On average, appreciation was not high and advice ($M = 4.31, SD = 1.76$) was appreciated higher than feedback ($M = 3.65, SD = 1.82$). Participants who initially chose a healthy product appreciated advice significantly more than participants who initially chose an unhealthy product ($t(384) = -2.711, p = .007$). The mean values and standard errors of appreciation of advice and of feedback are presented in Figure 8.

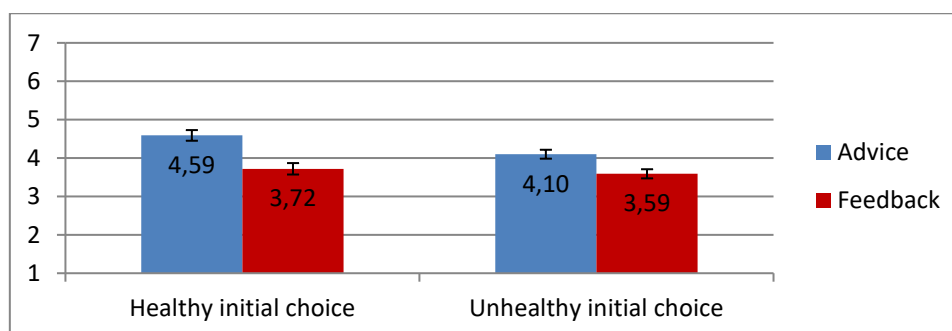


Figure 8: Mean appreciation of advice and feedback for initially healthy and unhealthy shoppers

Participants that revised their choice indicated to appreciate advice on average more than participants that did not revise their choice. An independent t-test was done and homogeneity of variances was violated ($F(2, 222) = 9.068, p = .003$). The difference between non-revisers and revisers was significant ($t(184.44) = -3.506, p = .001$). The difference in appreciation of feedback between non-revisers and revisers, was also significant ($t(222) = -3.074, p = .002$).

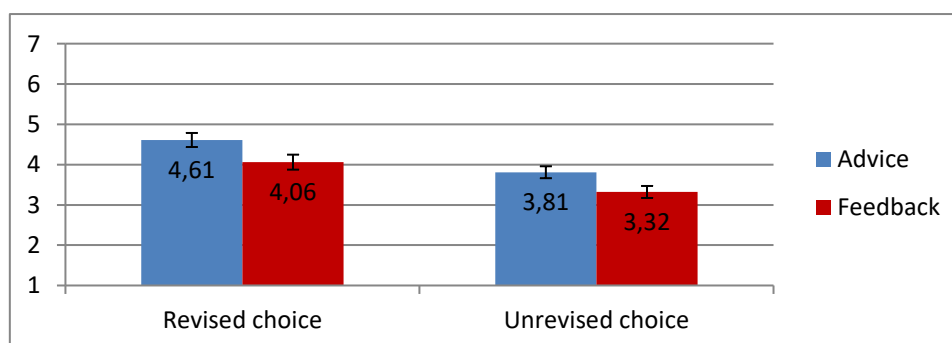


Figure 9: Mean appreciation of advice and feedback for revised and unrevised choices

6. Discussion

This study investigated if social normative feedback increases the likelihood that online grocery shoppers change their food choice to a healthier choice. As expected, social normative feedback led to a significantly higher amount of participants to revise their choice compared to no feedback on the sugar content of cookies. Distinctive for this study is the moment of intervention. Providing the feedback after product choices were made, but before payment would have taken place, appeared to be successful. The social normative feedback was compared to a more traditional source of feedback, that of the Dutch Nutrition Centre. The latter appeared to be more successful than the social normative feedback since more participants revised their choice when receiving feedback of the Nutrition Centre. The results of this study are in contrast with results from previous research stating that providing information has only limited effectiveness (Garcia, 2007; Marteau et al., 2012; Variyam & Cawley, 2006). Having limited information processing capacity and problems with self-control contribute to this limited effectiveness of providing information about what is healthy (Downs et al., 2009). These problems might have been taken away by the clear graphical display of the feedback and the fact that online orders are made for the future, in which the reward of snacks is valued less than for immediate choices (Huyghe et al., 2016).

To gain insight in reasons for online grocery shoppers to revise their product choice, underlying motivations were measured. These can explain why people would change their initial choice. It is interesting that social upward comparison appeared to be highest for participants that received feedback from the Dutch Nutrition Centre and lowest for participants that did not receive feedback. The participants in the normative feedback condition did not significantly differ in comparing themselves to others with both other groups. It was expected that the social normative feedback would cause most comparison and most revised choices, but apparently the Nutrition Centre did arise stronger associations with others. As the Nutrition Centre is well known in the Netherlands, people possibly think of their advice as how others also believe what they should do. It might have been perceived more like an injunctive norm than a traditional way of providing information, having more effectiveness in changing unhealthy shopping behavior of people than expected. A reason for the lower social comparison by participants in the normative feedback condition compared to the feedback of the Nutrition Centre is that the credibility of the textual feedback they received was low. This explains why less people chose to change their initial choice than in the feedback condition of the Nutrition Centre, as credibility appeared to be important for the effectiveness of normative feedback (Polonec et al., 2006).

The overall mean values of social upward comparison were low however, which means that participants indicated that they did not compare themselves to others. In the research of Nolan and colleagues (2008) participants also indicated that beliefs of others were least important in their decisions. Therefore it is likely that in this study people were not aware of the comparison they make between themselves and others, which explains the low values of social upward comparison. The same accounts for the feelings of inaccuracy and feelings of punishment, which were also low on average. Other research that has studied feelings of inaccuracy and of punishment used a lexical decision experiment (Jacobson et al., 2011) and fMRI (Klucharev et al., 2009) to do so, which explains the difference with the self-reported feelings of inaccuracy and of punishment in this study. Nevertheless, higher social comparison led, as expected, to higher feelings of inaccuracy and feelings of punishment. Those were in turn correlated with revision of

choice. Participants that received feedback from the Nutrition Centre scored highest on inaccuracy and on punishment, whereas participants in the control condition experienced the lowest feelings of inaccuracy and punishment. Even though the mean values were again low, this fits the expectations of the link between social comparison and revision of choice, being mediated by feelings of inaccuracy and punishment.

The higher the reactance, the less likely was the chance that someone would change his choice when looking at all participants in general. The suggestions and feedback did however not cause different strengths of reactance among the different conditions, so the different types of feedback did not have a different influence on reactance.

6.1. Limitations and further research

A few limitations of this study need to be acknowledged and suggestions for further research are offered. The study population is one issue that might have influenced the results of this study. The frequency that participants shop their groceries online was very low in this study. As online shoppers are different from online shoppers (Andrews and Currim, 2004), results might have been different with only frequent online grocery shoppers. For this study, however, it was necessary to allow non-frequent online shoppers to participate to reach a good sample size. No differences in online grocery shopping frequency were found between the conditions and a higher frequency did not relate to a higher or lower chance of revision of choice. Therefore, the results would probably be similar with a frequent online shopping population.

Concerning the level of education the population does not represent the average Dutch population as the average level of education of participants was high. Also, a large part of participants were Wageningen University students, who care relatively much about healthy eating compared to other Dutch inhabitants. The number of people that revised their choice is therefore maybe higher, as they might be more willing to respond based on the feedback. On the other hand, this could imply that the number of people that initially chose a healthy product would have been lower with a different study population, leaving room for more people to receive feedback on their unhealthy choice and to revise their choice.

The norm group used in this study were people of the same age as participants. Maybe this was not close enough for people to relate themselves to and care about, but this was not asked to participants. However, referring to a closer group might have caused a higher perceived threat of freedom and irritation among participants since they might not appreciate that a supermarket knows what choices people from a norm group close to them make. Besides that it is difficult to present a more personalized norm in real life, the descriptive norm did already score low on credibility, which could be even lower for a reference group closer to participants.

As with many studies, this study made use of a hypothetical situation. Pham (2013) criticizes such 'theories of studies' since they do not show us what consumers would do in a real-life situation. For the current study it was infeasible to study the effect of feedback on the behavior of customers in a real online supermarket, but future research could take place in an existing online supermarket. Then customers can receive feedback on several different products while doing their groceries like they would usually do. In this study a high amount of people was willing to change their initial product for a healthier product. The likelihood to switch might be lower when having to spend money, as the healthier products are more expensive than the unhealthy products. Furthermore, in the current situation the product selection was limited and not all participants would frequently buy the products offered. Results showed however that the

frequency of eating did not relate to whether participants did or did not revise their initial product choice. As people might want to stick to their decisions once they have chosen, the effect of giving advice before the products are selected could be even bigger than the effects of this study and could be a topic of future research.

The current study measured the effect of feedback at one point in time. It would be interesting to study if the effect of feedback on product choice lasts over time. Templeton, Stanton and Zaki (2016) have found that social norms still affect opinions after three days, would this also be the case for the behavioral change that is caused by the social feedback and over a longer period of time than a few days? Future research could follow people over time and see if they would again buy the healthy product the next times they do their groceries or if providing feedback every time they do groceries remains effective.

6.2. Practical implications

This unique study on the effect of normative feedback on online food choices has several practical implications. First of all, the use of social feedback appeared to be effective in an online shopping environment to let people make healthier product choices. It was useful to discover that the feedback as well as the suggestions did not cause reactance among the participants. This could thus be used in online supermarkets in order to help people buy more healthy products. Furthermore, the use of feedback from the Nutrition Centre appeared to be more effective than expected and even more successful than the use of a descriptive norm. This shows that there are possibilities for the Nutrition Centre to collaborate with online retailers to help consumers make healthier product choices. Next, as advice about healthy choices was appreciated higher than feedback on choices made, online retailers could offer advice on healthy food choices as an extra service to consumers. It is a promising method to let consumers make healthier food choices in the fast growing market of online grocery shopping.

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Appendix A: Complete questionnaire

Product choice: 'AH kruidkoekrepen'

Condition: Normative feedback



Welkom bij dit onderzoek!

Beste deelnemer,

Vul deze vragenlijst alstublieft in via een computer of laptop, omdat afbeeldingen die u te zien krijgt te groot zijn voor smartphones.

Allereerst zult u een aantal algemene vragen krijgen. Vervolgens krijgt u instructies om boodschappen te gaan doen in een online supermarkt, lees deze zorgvuldig door. Tot slot volgen een aantal aanvullende vragen. Er zijn geen goede of foute antwoorden mogelijk, dus vul alstublieft alles naar waarheid in.

Uw antwoorden zullen vertrouwelijk worden behandeld, waarbij uw anonimiteit wordt gewaarborgd. Het beantwoorden van de vragenlijst duurt maximaal tien minuten. Als u vragen heeft over de vragenlijst, kunt u deze mailen naar anke.vantklooster@wur.nl.

Alvast bedankt voor uw deelname!

- ☐ Ik vul deze vragenlijst op een computer of laptop in
- ☐ Ik vul deze vragenlijst via een telefoon in

Volgende

Hoe oud bent u?

Wat is uw geslacht?

- ☐ Man
- ☐ Vrouw

Wat is uw hoogst afgeronde/huidige opleiding?

- ☐ Lagere school
- ☐ VMBO/Mavo
- ☐ MBO
- ☐ Havo
- ☐ VWO
- ☐ HBO
- ☐ WO Bachelor
- ☐ WO Master













Instructies boodschappen

Bij de volgende drie schermen gaat u boodschappen doen in een online supermarkt. U mag op iedere pagina 1 product uitkiezen dat u zou kopen voor uzelf uit deze selectie. U kiest een product door er op te klikken. Wanneer u er nogmaals op klikt, maakt u uw keuze ongedaan.

Klik na uw productkeuze op de pijltjes rechtsonder in het scherm om door te gaan.











Volgende

Afwasmiddel

 0.⁹⁹ Neutral Afwasmiddel parfumvrij 500 ml 	 1.²⁹ AH BASIC Afwasmiddel ultra 500 ml 	 1.⁹⁹ Dreft Afwasmiddel original 500 ml 
 0.⁹⁹ AH Afwasmiddel 500 ml 	 1.²⁹ AH Afwasmiddel puur 500 ml 	 1.⁹⁹ Dreft Afwasmiddel original citroen 500 ml 













Volgende

Tussendoortjes

 <p>goed bezig BOLLETO KROKANTE cranberry goed bezig</p> <p>1.65</p> <p>Bolletje Krokante graanrepen cranberry goed bezig 225 g</p> <p>+</p>	 <p>WIEGER SNELLE JELLE kruidkoek</p> <p>1.79</p> <p>Wieger Ketellapper Snelle Jelle kruidkoek 5 stuks</p> <p>+</p>	 <p>MUESLI REEP yoghurt</p> <p>1.19</p> <p>AH Mueslireep yoghurt 160 g</p> <p>+</p>	 <p>AH kruidkoekrepen</p> <p>1.19</p> <p>AH Kruidkoekrepen 5 stuks</p> <p>+</p>	 <p>MUESLI REEP light chocolade</p> <p>1.39</p> <p>AH Mueslireep light chocolade 110 g</p> <p>+</p>
 <p>WIEGER SNELLE JELLE zero</p> <p>1.89</p> <p>Wieger Ketellapper Snelle Jelle zero 4 stuks</p> <p>+</p>	 <p>goed bezig BOLLETO Zachte appel (goed bezig)</p> <p>1.75</p> <p>Bolletje Zachte graanrepen appel (goed bezig) 245 g</p> <p>+</p>	 <p>AH Koekrepen minder suiker</p> <p>1.59</p> <p>AH Koekrepen minder suiker 5 stuks</p> <p>+</p>	 <p>MUESLI REEP light zomerfruit</p> <p>1.39</p> <p>AH Mueslireep light zomerfruit 5 stuks</p> <p>+</p>	 <p>MUESLI REEP chocolade</p> <p>1.19</p> <p>AH Mueslireep chocolade 160 g</p> <p>+</p>

Volgende

Pasta

 1.49 Grand'Italia Fusilli integrali 500 g 	 0.95 AH Fusilli 500 g 	 0.89 AH Spaghetti 500 g 
 1.20 Grand'Italia Fusilli tradizionali 500 g 	 0.55 AH BASIC Spaghetti 500 g 	 1.20 Grand'Italia Spaghetti tradizionali 500 g 

Volgende

Mijn bestelling

Boodschappen



Dreft Afwasmiddel original
500 ml

1.99
1 stuk



AH Kruidkoekrepen
5 stuks

1.19
1 stuk

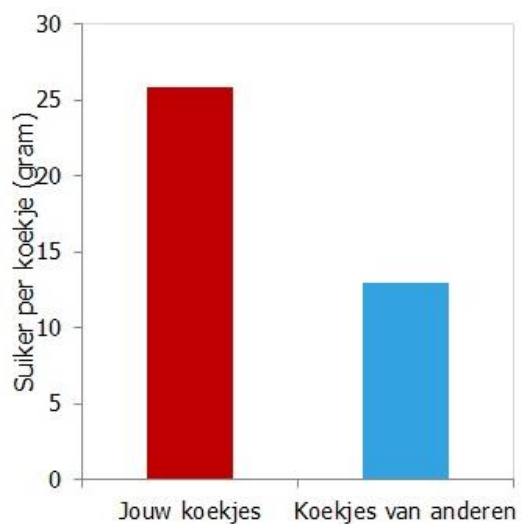


AH Fusilli
500 g

0.95
1 stuk

Andere klanten van 23 kopen koekjes waar minder suiker in zit.

Probeer een van deze producten met minder suiker eens:



1.⁵⁹

AH Koekrepen minder
suiker
5 stuks

Vervang voor mijn koekjes



1.⁸⁹

Wieger Ketellapper Snelle
Jelle zero
4 stuks

Vervang voor mijn koekjes

Volgende

Bedankt voor uw bestelling.

Volgende

Nu volgen een aantal vragen over de koekjes die u zojuist heeft besteld. Denk hierbij terug aan het moment dat u uw winkelmandje te zien kreeg.

Bij het zien van de pagina met de door mij gekozen producten:

	Helemaal mee oneens	Mee oneens	Beetje mee oneens	Niet mee oneens/niet mee eens	Beetje mee eens	Mee eens	Helemaal mee eens
Vergeleek ik de hoeveelheid suiker in mijn koekjes met die van anderen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dacht ik na over de hoeveelheid suiker in mijn koekjes in vergelijking met die van anderen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Beoordeelde ik de hoeveelheid suiker in mijn koekjes ten opzichte van die van anderen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Volgende

Denk weer aan het moment dat u uw winkelmandje te zien kreeg en geef uw mening over de volgende standpunten.

Bij het zien van de pagina met de door mij gekozen producten:

	Helemaal mee oneens	Mee oneens	Beetje mee oneens	Niet mee oneens/niet mee eens	Beetje mee eens	Mee eens	Helemaal mee eens
Kreeg ik het gevoel dat de hoeveelheid suiker in mijn koekjes teveel is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Besepte ik dat de hoeveelheid suiker in mijn koekjes beter had kunnen zijn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wist ik dat de hoeveelheid suiker in mijn koekjes niet goed is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Volgende

Denk weer aan het moment dat u uw winkelmandje te zien kreeg en geef uw mening over de volgende standpunten.

Het zien van de pagina met de door mij gekozen producten:

	Helemaal mee oneens	Mee oneens	Beetje mee oneens	Niet mee oneens/niet mee eens	Beetje mee eens	Mee eens	Helemaal mee eens
Gaf een onaangenaam gevoel over de hoeveelheid suiker in mijn koekjes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zorgde dat ik een slecht gevoel kreeg over de hoeveelheid suiker in mijn koekjes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Voelde als een negatieve beoordeling over de hoeveelheid suiker in mijn koekjes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Volgende

Denk nu aan het moment dat u koos om andere koekjes te kopen dan u in eerste instantie had gekozen.

Het kiezen voor andere koekjes:

	Helemaal mee oneens	Mee oneens	Beetje mee oneens	Niet mee eens/niet mee eens	Beetje mee eens	Mee eens	Helemaal mee eens
Gaf me een goed gevoel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Zorgde ervoor dat ik een fijn gevoel kreeg	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maakte een blij gevoel in me los	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Waarom gaf de keuze voor andere koekjes je wel/niet een goed gevoel?

Volgende

Door de feedback die de online supermarkt gaf op mijn productkeuze, ervaarde ik de volgende gevoelens:

	Helemaal niks van dit gevoel	Bijna niks van dit gevoel	Een beetje van dit gevoel	Veel van dit gevoel	Heel veel van dit gevoel
Blij	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Geïrriteerd	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Boos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tevreden	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vrolijk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Geërgerd	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

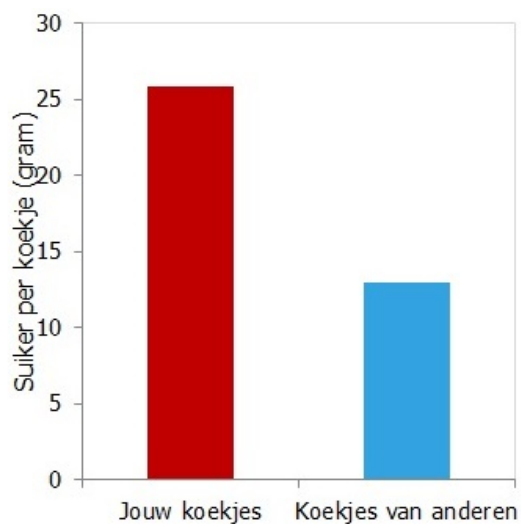
Doordat de online supermarkt feedback op mijn productkeuze gaf:

	Helemaal mee oneens	Mee oneens	Beetje mee oneens	Niet mee oneens/niet mee eens	Beetje mee eens	Mee eens	Helemaal mee eens
Wilde ik minder suiker eten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wilde ik juist niet minder suiker eten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wilde ik juist extra suiker eten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wilde ik gezonder eten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wilde ik juist ongezonder eten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Door de feedback op mijn productkeuze probeerde de online supermarkt:

	Helemaal mee oneens	Mee oneens	Beetje mee oneens	Niet mee oneens/niet mee eens	Beetje mee eens	Mee eens	Helemaal mee eens
Mijn vrijheid om zelf te kiezen te bedreigen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Me te helpen met mijn keuze	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Me advies te geven	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Een beslissing voor me te maken	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Me te manipuleren	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Me te assisteren in mijn keuze	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Druk op me uit te oefenen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Volgende



Geef aan in hoeverre u het eens bent met de volgende stelling.

	Helemaal mee oneens	Mee oneens	Beetje mee oneens	Niet mee oneens/niet mee eens	Beetje mee eens	Mee eens	Helemaal mee eens
De bovenstaande grafiek, die bij mijn winkelmandje werd weergegeven, was geloofwaardig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

"Andere klanten van 23 kopen koekjes waar minder suiker in zit."

Geef aan in hoeverre u het eens bent met de volgende stelling.

	Helemaal mee oneens	Mee oneens	Beetje mee oneens	Niet mee oneens/niet mee eens	Beetje mee eens	Mee eens	Helemaal mee eens
De bovenstaande informatie, die bij mijn winkelmandje werd weergegeven, was geloofwaardig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Volgende

Het tonen van vervangende productsuggesties door de online supermarkt zorgde ervoor dat ik de volgende gevoelens ervaarde:

	Helemaal niks van dit gevoel	Bijna niks van dit gevoel	Een beetje van dit gevoel	Veel van dit gevoel	Heel veel van dit gevoel
Blij	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Geïrriteerd	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Boos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tevreden	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vrolijk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Geërgerd	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Doordat de online supermarkt vervangende productsuggesties toonde:

	Helemaal mee oneens	Mee oneens	Beetje mee oneens	Niet mee oneens/niet mee eens	Beetje mee eens	Mee eens	Helemaal mee eens
Wil ik minder suiker eten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wil ik juist niet minder suiker eten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wil ik juist extra suiker eten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wil ik gezonder eten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wil ik juist ongezonder eten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Door het tonen van vervangende productsuggesties probeerde de online supermarkt:

	Helemaal mee oneens	Mee oneens	Beetje mee oneens	Niet mee oneens/niet mee eens	Beetje mee eens	Mee eens	Helemaal mee eens
Mijn vrijheid om zelf te kiezen te bedreigen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Me te helpen met mijn keuze	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Me advies te geven	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Een beslissing voor me te maken	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Me te manipuleren	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Me te assisteren in mijn keuze	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Druk op me uit te oefenen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Volgende

Tot slot volgen nu een aantal aanvullende vragen.

Volgende



AH Kruidkoekrepen
5 stuks

1.19
1 stuk

Hoe vaak eet u de koekjes die u in eerste instantie koos?

- ☐ Nooit
- ☐ Minder dan 1 keer per maand
- ☐ 1 tot 3 keer per maand
- ☐ Minstens 1 keer per week

Volgende

Hoe vaak koopt u de koekjes die u in eerste instantie koos?

- ☐ Nooit
- ☐ Minder dan 1 keer per maand
- ☐ 1 tot 3 keer per maand
- ☐ Minstens 1 keer per week

Volgende



AH koekrepen minder suiker
5 stuks

1.59
1 stuk

Hoe vaak eet u de koekjes die u uiteindelijk koos?

- ☐ Nooit
- ☐ Minder dan 1 keer per maand
- ☐ 1 tot 3 keer per maand
- ☐ Minstens 1 keer per week

Volgende

Hoe vaak koopt u de koekjes die u uiteindelijk koos?

- ☐ Nooit
- ☐ Minder dan 1 keer per maand
- ☐ 1 tot 3 keer per maand
- ☐ Minstens 1 keer per week

Volgende

Hoe vaak doet u online boodschappen?

- ☐ Nooit
☐ Minder dan 1 keer per maand
☐ 1 tot 3 keer per maand
☐ Minstens 1 keer per week

Volgende

Ik zou het fijn vinden als

	Helemaal mee oneens	Mee oneens	Beetje mee oneens	Niet mee oneens/niet mee eens	Beetje mee eens	Mee eens	Helemaal mee eens
ik advies krijg om gezondere productkeuzes te maken	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ik feedback krijg op mijn productkeuzes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Waarom vindt u dit wel/niet fijn?

Volgende

Geef antwoord op de volgende vragen.

	Nooit	Zelden	Soms	Vaak	Heel vaak
Wanneer je iets zwaarder bent geworden, eet je dan minder dan dat je gewoonlijk doet?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Probeer je minder te eten tijdens maaltijden dan dat je eigenlijk zou willen?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hoe vaak weiger je eten of drinken, omdat je bang bent dat je zwaarder wordt?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Houd je exact bij wat je eet?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eet je opzettelijk producten waarvan je afvalt?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wanneer je teveel hebt gegeten, eet je dan de daarop volgende dagen minder?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eet je opzettelijk minder om te voorkomen dat je zwaarder wordt?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hoe vaak probeer je geen tussendoortjes te nemen, omdat je op je gewicht let?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hoe vaak probeer je 's avonds niet te eten, omdat je op je gewicht let?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Houd je rekening met je gewicht wanneer je eet?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Volgende

Dit is het einde van de vragenlijst, bedankt voor uw deelname!

Vul hier uw e-mailadres in om kans te maken op de VVV-bon ter waarde van €30,-. Uw e-mailadres zal niet voor andere doeleinden worden gebruikt.

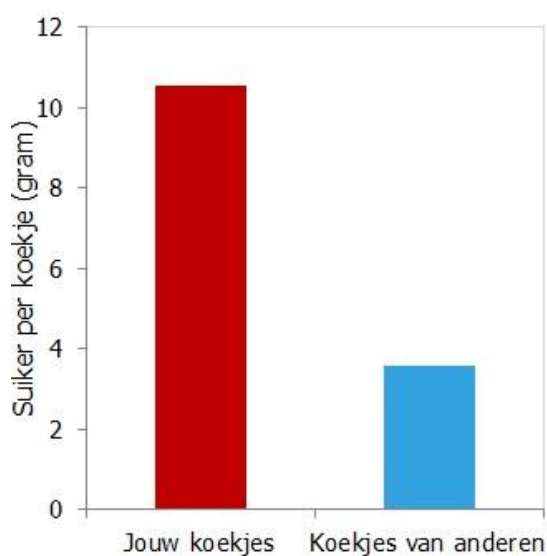
Heeft u nog opmerkingen over de vragenlijst?

Volgende

Appendix B: Overview interventions per product per condition

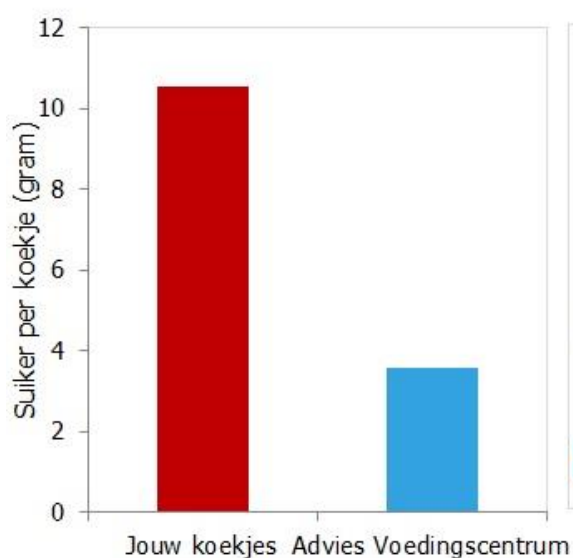
Initial product choice: 'AH Mueslireep chocolade'

Probeer een van deze producten met minder suiker eens:



 <p>1.39</p> <p>AH Mueslireep light chocolade 110 g</p> <p>Vervang voor mijn koekjes</p>	 <p>1.39</p> <p>AH Mueslireep light zomerfruit 5 stuks</p> <p>Vervang voor mijn koekjes</p>
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Probeer een van deze producten met minder suiker eens:



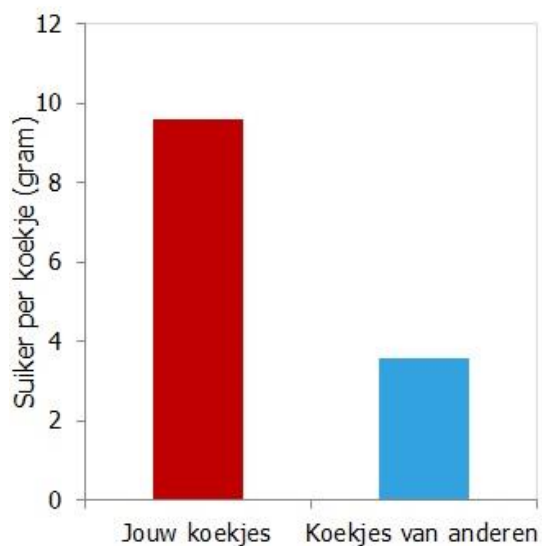
 <p>1.39</p> <p>AH Mueslireep light chocolade 110 g</p> <p>Vervang voor mijn koekjes</p>	 <p>1.39</p> <p>AH Mueslireep light zomerfruit 5 stuks</p> <p>Vervang voor mijn koekjes</p>
--	---

Probeer een van deze producten eens:

 <p>1.39</p> <p>AH Mueslireep light chocolade 110 g</p> <p>Vervang voor mijn koekjes</p>	 <p>1.39</p> <p>AH Mueslireep light zomerfruit 5 stuks</p> <p>Vervang voor mijn koekjes</p>
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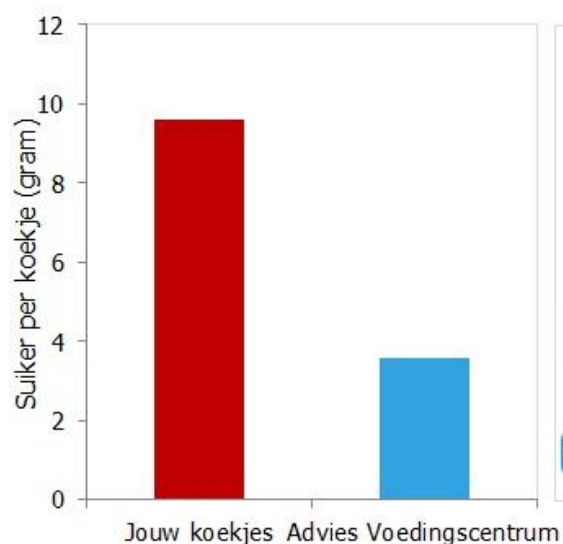
Initial product choice: 'AH Mueslireep yoghurt'

Probeer een van deze producten met minder suiker eens:



 <p>1.39</p> <p>AH Mueslireep light zomerfruit 5 stuks</p> <p>Vervang voor mijn koekjes</p>	 <p>1.39</p> <p>AH Mueslireep light chocolade 110 g</p> <p>Vervang voor mijn koekjes</p>
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Probeer een van deze producten met minder suiker eens:



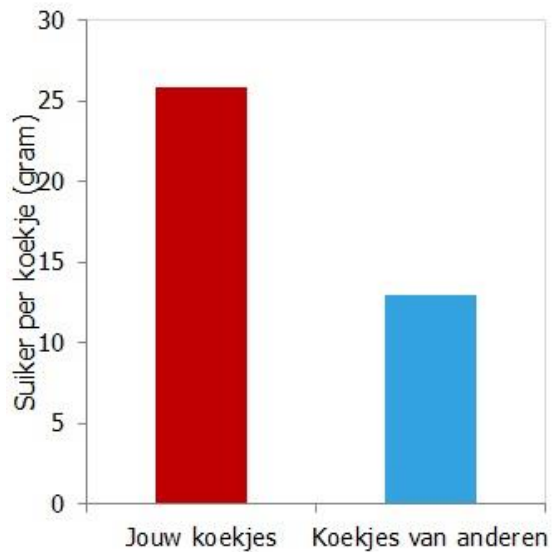
 <p>1.39</p> <p>AH Mueslireep light zomerfruit 5 stuks</p> <p>Vervang voor mijn koekjes</p>	 <p>1.39</p> <p>AH Mueslireep light chocolade 110 g</p> <p>Vervang voor mijn koekjes</p>
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Probeer een van deze producten eens:

 <p>1.39</p> <p>AH Mueslireep light zomerfruit 5 stuks</p> <p>Vervang voor mijn koekjes</p>	 <p>1.39</p> <p>AH Mueslireep light chocolade 110 g</p> <p>Vervang voor mijn koekjes</p>
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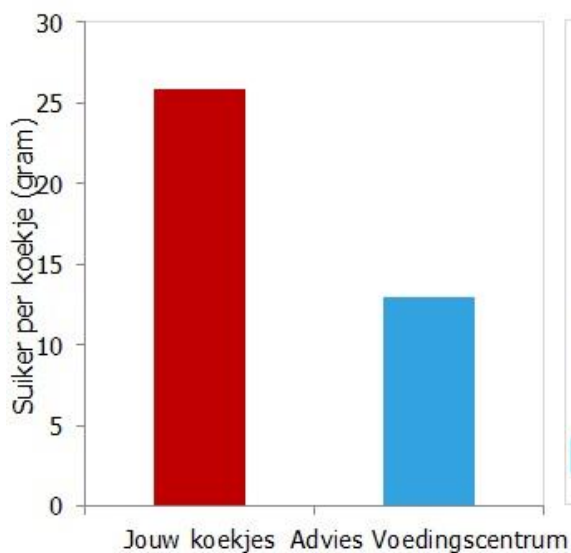
Initial product choice: 'AH Kruidkoekrepen'

Probeer een van deze producten met minder suiker eens:



 <p>1.⁵⁹</p> <p>AH Koekrepen minder suiker 5 stuks</p> <p>Vervang voor mijn koekjes</p>	 <p>1.⁸⁹</p> <p>Wieger Ketellapper Snelle Jelle zero 4 stuks</p> <p>Vervang voor mijn koekjes</p>
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Probeer een van deze producten met minder suiker eens:



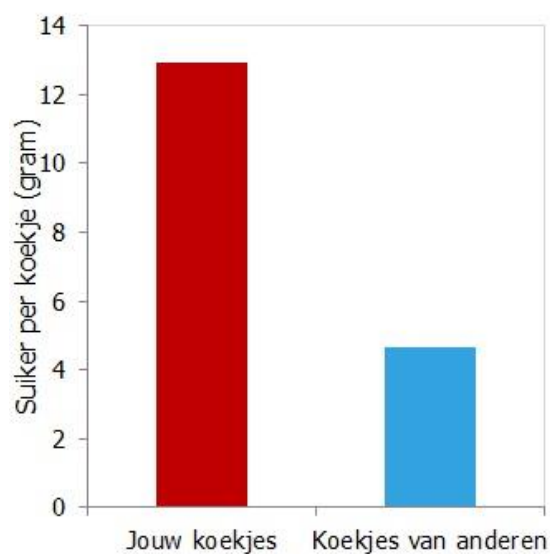
 <p>1.⁵⁹</p> <p>AH Koekrepen minder suiker 5 stuks</p> <p>Vervang voor mijn koekjes</p>	 <p>1.⁸⁹</p> <p>Wieger Ketellapper Snelle Jelle zero 4 stuks</p> <p>Vervang voor mijn koekjes</p>
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Probeer een van deze producten eens:

 <p>1.⁵⁹</p> <p>AH Koekrepen minder suiker 5 stuks</p> <p>Vervang voor mijn koekjes</p>	 <p>1.⁸⁹</p> <p>Wieger Ketellapper Snelle Jelle zero 4 stuks</p> <p>Vervang voor mijn koekjes</p>
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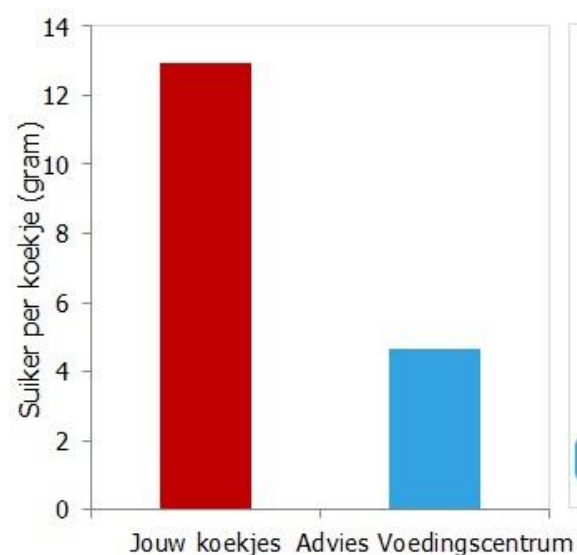
Initial product choice: 'Bolletje Zachte graanrepen appel (goed bezig)'

Probeer een van deze producten met minder suiker eens:



 <p>1.65</p> <p>Bolletje Krokante graanrepen cranberry goed bezig 225 g</p> <p>Vervang voor mijn koekjes</p>	 <p>1.39</p> <p>AH Mueslireep light zomerfruit 5 stuks</p> <p>Vervang voor mijn koekjes</p>
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Probeer een van deze producten met minder suiker eens:



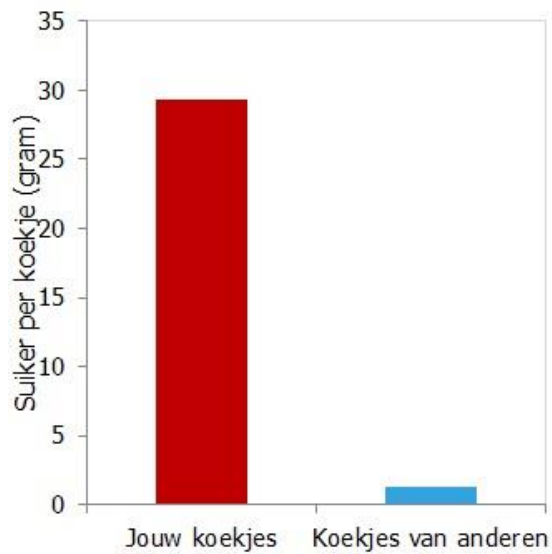
 <p>1.65</p> <p>Bolletje Krokante graanrepen cranberry goed bezig 225 g</p> <p>Vervang voor mijn koekjes</p>	 <p>1.39</p> <p>AH Mueslireep light zomerfruit 5 stuks</p> <p>Vervang voor mijn koekjes</p>
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Probeer een van deze producten eens:

 <p>1.65</p> <p>Bolletje Krokante graanrepen cranberry goed bezig 225 g</p> <p>Vervang voor mijn koekjes</p>	 <p>1.39</p> <p>AH Mueslireep light zomerfruit 5 stuks</p> <p>Vervang voor mijn koekjes</p>
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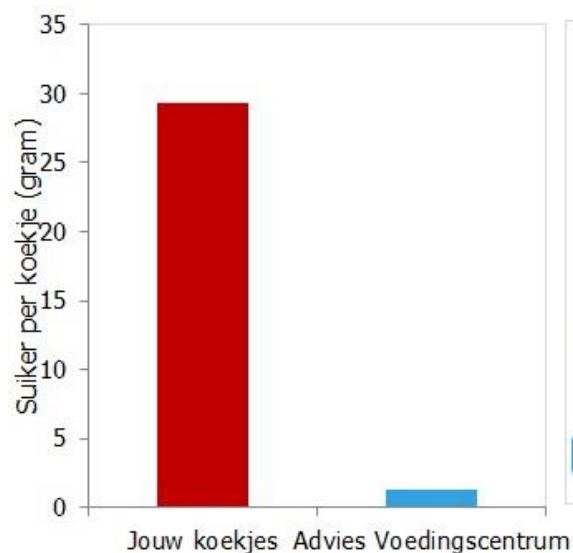
Initial product choice: 'Wieger Ketellapper Snelle Jelle Kruidkoek'

Probeer een van deze producten met minder suiker eens:





 <p>1.⁸⁹</p> <p>Wieger Ketellapper Snelle Jelle zero 4 stuks</p> <p>Vervang voor mijn koekjes</p>	 <p>1.⁵⁹</p> <p>AH Koekrepen minder suiker 5 stuks</p> <p>Vervang voor mijn koekjes</p>
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Probeer een van deze producten met minder suiker eens:



 <p>1.⁸⁹</p> <p>Wieger Ketellapper Snelle Jelle zero 4 stuks</p> <p>Vervang voor mijn koekjes</p>	 <p>1.⁵⁹</p> <p>AH Koekrepen minder suiker 5 stuks</p> <p>Vervang voor mijn koekjes</p>
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Probeer een van deze producten eens:

 <p>1.⁸⁹</p> <p>Wieger Ketellapper Snelle Jelle zero 4 stuks</p> <p>Vervang voor mijn koekjes</p>	 <p>1.⁵⁹</p> <p>AH Koekrepen minder suiker 5 stuks</p> <p>Vervang voor mijn koekjes</p>
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