# TEMPTATIONS AND HEALTHY CHOICES

IDENTIFYING SITUATIONS WHERE A HEALTH MESSAGE FACILITATES HEALTH GOAL ACTIVATION

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## 1. INTRODUCTION

Consumers are often confronted with tempting foods that are bad for their health in the long term. Think of delicious chocolate chip cookies that are high in saturated fats or refreshing soda that is full of sugar. Although these consumers might well have goals of eating healthily, more times than not they fail to forego on the temptation they are facing.  As is shown later on in this thesis, consumers have trouble reminding themselves of their health goals at those crucial moments where it could make a difference for the choices they make. Most of us can really use some help when we are facing shelves with unhealthy cookies, chocolate or snacks and struggle to forego on these temptations. In this thesis, the proposition is put forward that it makes sense to focus efforts on facilitating the activation of health goals at the point where 'bad' temptations are present and where indulging on those temptations can be avoided.

Research on goal activation has shown that goal-threatening temptations can serve as 'red-flag' cues that remind us of our long-term health goals (Fishbach, Friedman, & Kruglanski, 2003; Geyskens, Dewitte, Pandelaere, & Warlop, 2008). While this mechanism provides hope for consumers trying to eat healthily, a check upon obesity rates and food related health issues in Western countries teaches us that there is a gap between theory and reality (James, 2008). In reality, whether or not temptations activate health goals is influenced by the amount of self-control a consumer is able to exert (Fishbach et al., 2003) and by the strength of the temptation that is involved (Kroese, Evers, & De Ridder, 2011). Both self-control and temptation strength can explain part of the gap between theory and reality in health goal activation.

The importance of self-control is a direct result of the nature of the temptation-goal activation mechanism. This mechanism comes into existence when, over time, consumers repeatedly exert self-control when faced with a certain temptation. The repetition leads to facilitated links between the temptation and the goal it is threatening, making the goal accessible upon seeing the temptation. For consumers with low levels of self-control by nature (Fishbach & Shah, 2006) or with a temporarily depleted self-control resource (Vohs & Heatherton, 2000), making these temptation-goal links is not facilitated and health goal activation is thus inhibited.

The strength of the temptation consumers face explains another part of the gap, but its influence on health goal activation is counterintuitive. Strong temptations, i.e. a very good looking brownie, come with high anticipated costs to one's health, which increases the chance that consumers activate health goals (Trope & Fishbach, 2000). Weak temptations meanwhile prove to be more damaging to

health goal pursuit because the low anticipated costs of indulging make sure that the activation of health goals is inhibited (Kroese, Evers, et al., 2011). Similar effects were found for tempting foods that were presented in small packages versus tempting foods in large packages. Consumers presented with a temptation in large packages eventually consumed less than those presented with small packages (Coelho do Vale, Pieters, & Zeelenberg, 2008).

In the situations where our self-control or the nature of the temptation makes it hard to think of health goals, consumers can really use some help. This help should be present at the place and time where consumers decide whether or not to indulge on an unhealthy food temptation. That is why this research proposes placing health messages close to the tempting foods that present a threat to consumers health goals. In practice this means placing a message in an incongruent context, something that has shown to be effective in other fields of study. Placement of advertisements into media with incongruent themes showed enhanced ad processing and better ad evaluations (Dahlén, Rosengren, Törn, & Öhman, 2008). Enhanced processing was also found for moderate product-schema incongruity (Meyers-Levy & Tybout, 1989). The placement of messages in an incongruent context can increase the amount of attention paid to the message by those consumers who are about to indulge on unhealthy foods. With both the health message and the temptation in mind, a discrepancy between the current state of 'craving something unhealthy' and the desired state of 'healthy eating' becomes visible, increasing the chances for goal activation (Sela & Shiv, 2009).

This research sets out to show that health goals can be activated with the help of a health message in those situations where lack of self-control and/or lack of temptation strength would predict no goal activation.

*Social and Scientific Relevance*

Making it easier for consumers to activate health goals helps them to make choices that are better in line with those goals and are thus healthier. In addition to long-term positive effects on personal health, goal attainment also invokes positive emotional responses in consumers (Higgins, Shah, & Friedman, 1997). In general, society could benefit from consumers eating more healthily. It would reduce the number of food related health and would thereby lower health care costs as well. Producers and retailers will likely be more skeptical when it comes to placing health messages near tempting foods. A reduction in sales of tempting food products might well hurt their margins.

Building on goal activation research, this thesis identifies the conditions under which consumers are not expected to activate health goals. For these conditions, the influence of the presence of a health message is reviewed and tested in an experiment. This thesis thereby broadens the understanding of health goal activation and provides new insight into the effects of health messages next to tempting food products.

## 1.1 RESEARCH QUESTIONS

*Main Research Question*

How does presenting a health message next to tempting but unhealthy products influence consumer choice?

*Sub Questions*

1. What is the effect of a health message on consumers' health goal activation and the choice for healthy products?
2. How does the effect of the health message differ for consumers that have high versus low levels of self-control?
3. What is the effect of the strength of the temptation on consumers' health goal activation and the choice for healthy products?
4. How does self-control moderate the relationship between temptation strength and goal activation?

## 1.2 OUTLINE

First, a theoretical framework will be built in which the factors that prevent health goal activation are discussed. After that the role of health messages placed in an incongruent context is discussed based on previous studies in related research fields. This is followed by an experiment which will be carried out to see whether health messages can facilitate goal activation in those situations where goals are not likely to be activated. The results of this experiment are presented and discussed, together with the limitations of this study. Finally, recommendations are made for future research.

## 2. THEORETICAL OVERVIEW

This theoretical overview will discuss how consumer self-control and the strength of temptations influence the activation of health goals. It discusses how health messages can activate health goals in those situations where activation would otherwise not be likely. The overview starts by explaining the role of goals in consumer decision making, explaining how temptations can automatically activate higher order goals and how the depletion of self-control can inhibit the activation of those goals. The strength of the temptation and its counterintuitive influence on goal activation is detailed, as well as its interaction with self-control depletion. The influence of presenting health messages together with temptations is discussed for different temptations strengths and/or for situations where consumers have depleted self-control. Literature on message-context incongruity is reviewed to provide a theoretical backdrop for the expected influence of health messages in these situations.

### 2.1    GOALS

Goals play an important role in consumer decision making. Having a goal in mind can steer consumer behavior, especially if that goal is seen as contributing to higher order goals. These higher order goals are goals that are highly valued by consumers and have a chronic presence in their lives. Think of the goal of being a good father or the goal of staying in good health. If staying in good health is a higher order goal, consumers will make choices that contribute directly or indirectly to the pursuit of this goal (Bettman, Luce, & Payne, 1998; Higgins, 2002). The stronger they have this goal in mind, the more likely it is that they will make decisions contributing to the achievement of that goal.

**H1***: Stronger (presence of) health goals predict more healthy (or less indulgent) choices*

Whether or not consumers act on a goal also depends on what other goals are in play at a given moment. Consumers often have multiple goals at a time and these goals can be conflicting (Chartrand, Huber, Shiv, & Tanner, 2008; Fishbach & Dhar, 2005). How consumers solve these conflicts is the topic of scientific debate, with two main approaches, describing consumers as rational goal managers ('econs') on one side and as humans influenced by situational cues on the other. Making rational choices would mean that 'econs' engage in deliberate goal management, balancing their choices in a choice session in such a way that multiple goals are satisfied (Dhar & Simonson,

1999; Laran, 2010). While this active goal management might explain a part of consumer behavior, it does not tell the whole story. For the better part, our behavior can be best explained from the perspective of the 'human' consumer. These consumers are not rational and active goal managers, they are influenced by their environment (Thaler & Sunstein, 2008), as will be explained in the next section.

## 2.2     GOAL PURSUIT FROM ENVIRONMENTAL CUES

Goals can be pursued consciously, and goal conflict can be handled actively, but goals can also steer behavior in an unconscious way (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001; Chartrand & Bargh, 1996). Without being consciously aware of them, cues in the environment can lead consumers to pursue certain goals. Chartrand et al. (2008) showed that consumers who were primed with prestige goals were more likely to buy high-priced Nike socks than those primed with frugality-related goals. None of the respondents suspected that the priming task had anything to do with their choices. In another study, thirsty participants that were subliminally primed with thirst related words drank significantly more than those who were primed with neutral words (Strahan, Spencer, & Zanna, 2002). Although in this case respondents activated goals that were consistent with the prime that they were subjected to, this consistency is not a condition for goal activation. Goals can be activated upon confrontation with primes or cues that are inconsistent with the goal. This can happen when consumers face a tempting product and subsequently activate a higher order goal that is threatened by giving in to this temptation (Fishbach et al., 2003). At this point, it has to be noted that some caution should be taken with the findings of priming research. Recently, the replicability of priming studies has been taking flak, as well as the actual influence of priming effects (Carpenter, 2012; Kahneman, 2012). The issues raised in this 'priming debate' will be further reflected upon in the discussion section of this thesis.

## 2.3     HEALTH GOALS ACTIVATED BY TEMPTATIONS

Even a long standing goal of eating healthy might not stand a chance against the pleasure expected from indulging on that delicious looking muffin in the canteen. Consumers are often in a situation where short term goals like deriving pleasure from tasty food threaten important long term goals. It is easy to understand why people fall for these temptations. But at the same time it is obvious that people cannot always give in to temptations should they want any chance of attaining important long term goals like being healthy. It would be much more helpful if a 'bad' temptation reminded us of our long term goal. This is what Fishbach et al. (2003) argued when they set out to find whether temptations can activate the higher order goals they threaten. They propose consumers encounter many situations where they can resist temptations that threaten goal attainment. Over time, resisting these temptations would lead to stronger links (associations) between the specific temptations and the goals they conflict with. These stronger links would then facilitate activation of a health goal when a temptation associated with that goal presented itself. Fishbach et al. tested their hypotheses and found that temptations indeed activated goals and that these associations were made automatically. Cognitive load (remembering a 9-digit number) did not affect the activation of religious goals when people were primed with temptation/sin related words. It is therefore likely that it is a process that requires little cognitive resources. Although these results make a strong case for the temptation-goal activation relationship, there are gaps between the theory and the choices consumers make in reality. To explain why these gaps are there, the influence of temptation strength and self-control on goal activation needs to be discussed.

## 2.4 FACTORS INFLUENCING HEALTH GOAL ACTIVATION

### 2.4.1    TEMPTATION STRENGTH

At first glance, one would expect that the amount of temptation is an important factor in the activation of health goals. And indeed, support can be found for the influence of the strength of a temptation on activation of goals. However, where one would be inclined to expect that strong temptations overwhelm us and inhibit health goal activation, exactly the opposite effect has been

found in previous research. Coelho do Vale et al. (2008) found that presenting consumers with tempting food products in a large package size resulted in less consumption when compared to small package sizes. An explanation for this finding can be found in *counteractive control theory*, which predicts an increased self-regulation effort when consumers anticipate high costs if they give in to a strong temptation (Trope & Fishbach, 2000). In line with this theory, Kroese et al. (2011) found that stronger temptations positively influence the activation of self-regulation processes, whereas weaker temptations may inhibit the activation of higher order goals. To arrive at these results the authors used three different methods of manipulating temptation strength. Temptations presented in text, pictures and actual products were used, each time comparing a strong temptation to a weak temptation. Similar results were found for all types of temptation presentations, with strong temptations leading to stronger health goal activation. Subsequently, participants also consumed less of a strongly attractive chocolate cake as compared to a weakly attractive chocolate cake (Kroese, Evers, et al., 2011).

Counter intuitively, the stronger a temptation is perceived by a consumer, the more likely it is that health goals are activated. This way weak temptations can eventually be more damaging to long-term goal attainment than strong temptations. This appears to be true for the size of a temptation (e.g. small versus large package), but in similar fashion also for the attractiveness of a temptation.

**H2:** *Temptation strength positively influences health goal activation*

### 2.4.2   SELF-CONTROL DEPLETION

High priority goals like eating healthy thus can be activated by temptations. Clearly though, this does not happen for everyone in every situation, or there would be no problems regarding unhealthy eating and obesity to begin with. The concept of self-control is the key to the explanation why some do and others do not automatically activate a higher order goal. When consumers are able to exert self-control when facing a temptation, they are more likely to activate a health goal (Fishbach et al., 2003). But there are situations where the use of self-control is inhibited. Think about strolling through the supermarket after a busy and demanding day at work. All of a sudden it is much harder to deny yourself these tempting snacks you would normally pass by. This has been documented in a body of scientific research around the term 'self-control depletion' (sometimes called ' ego depletion'). During research into self-control processes, it was found that the repeated use of self-

control would reduce the amount of self-control that was left (Baumeister, Vohs, & Tice, 2007; Hagger, Wood, Stiff, & Chatzisarantis, 2010; Vohs, 2006). As it turned out, self-control is a finite resource that runs out when we use it generously. Self-control depletion has been shown to influence behavior, for example by reducing the time participants spent solving an unsolvable puzzle or by increasing the amount of impulsive buying among consumers (Baumeister et al., 2007; Vohs, 2006). Consequently, we would expect that consumers with depleted self-control will be inhibited in activating their health goals, whereas consumers with non-depleted self-control can activate health goals without inhibition.

**H3:** *Self-control depletion has a direct and negative effect on health goal activation.*

This might seem to contradict the research of Fishbach as reported in section 2.3, stating that goal activation is not affected by cognitive load. However, there is a crucial difference between the type of cognitive load (remembering a 9-digit number) used by Fishbach and the type of load that drains our self-control resource. Tasks that that deplete our self-control resource are mainly about overriding our natural response (e.g. *not* thinking about white bears; the Stroop test) (Hagger et al., 2010; Muraven et al., 1998). The task of remembering a number has no such properties. A high cognitive load has even been found to have the opposite effect of self-control depletion. When primed with pictures of attractive food, people under high cognitive load (remembering an 8-digit number) did not activate hedonic thoughts (Van Dillen, Papies, & Hofmann, 2012). Unlike the research of Shiv & Fedorikhin (1999, 2002) that shows that cognitive load affects our impulse control *when we are already tempted*, van Dillen et al. (2012) find that cognitive load affects *whether we see a stimulus as tempting*. In short, a consumer under a high cognitive load might fail to notice that a certain product is tempting, whereas a depleted consumer would be tempted but unable to activate health goals. The research of Zemack-Rugar & Fitzsimons (unpublished) (2011) gives another indication that depletion and cognitive load may not have similar effects. They show that depletion (suppressing emotion) and cognitive load (remembering a 9-digit number) have differential effects on decision making. Noticeably, cognitive load (as opposed to depletion) leads to awareness of a diminishment in decision making capabilities.

Taken together this leads us to expect that self-control depletion affects health goal activation differently than cognitive load.

### 2.4.3   TEMPTATION STRENGTH AND SELF-CONTROL INTERACTION

The influence of temptation strength on health goal activation differs for consumers with high self-control versus those with low self-control. Consumers with non-depleted levels of self-control are better able to activate health goals when facing strong temptations compared to weak temptations. Their self-control mechanism sees strong temptations as a bigger threat to the health goal. However, consumers with depleted self-control are not likely to activate health goals when facing strong temptations, because the self-control mechanism does not intervene. Therefore, depletion of self-control affects the way temptation strength influences health goal activation.

**H4:** *When consumers have depleted self-control, the strength of the temptation does no longer positively influence health goal activation.*

Having established that the strength of the temptation and the amount of self-control influence goal activation, it is clear that even with the best of intentions, some consumers will fail to activate health goals upon confrontation with temptations. These consumers can benefit from a health goal reminder in the form of a health message at the precise point where they face a temptation. The next sections will detail the expected influence of a health message on goal activation.

## 2.5 HEALTH MESSAGES

As mentioned in the introduction of this thesis, placing a health message near an unhealthy product automatically results in incongruence between message and context. Because a health message is not a message one might expect near unhealthy food products, there are consequences for the processing of the information in the health message. Although never studied for this specific situation, the incongruity effect has been studied before for within-message and product-schema incongruity (Dahlén et al., 2008; Meyers-Levy & Tybout, 1989). Based on this research, it can be expected that message-context incongruity will lead to heightened arousal. Heightened arousal is a state which, according to Lee & Schumann (2004), will positively influence the amount of processing that takes place upon viewing the message. From advertising research we know that incongruence between advertisements and the medium it is published in leads to enhanced processing and more favorable ad evaluations with consumers (Dahlén et al., 2008). More favorable evaluations and

enhanced processing were also found for moderate product-schema incongruity (Meyers-Levy & Tybout, 1989). It is likely that these effects will transfer to the domain of message-context incongruity. Therefore, a closer look is taken at the possible effects of increased processing on the activation of health goals.

### 2.5.1   HEALTH MESSAGES AND GOAL ACTIVATION

Incongruence between a message and its context can lead to enhanced processing, which has a direct effect on health goal activation. A key driver of goal activation is the desire to reduce the discrepancy between a current state and a desired end state (Higgins, 1987; Sela & Shiv, 2009). But before a discrepancy can be resolved, one has to be aware that it exists. The existence of the discrepancy between states is highlighted by the health message in the incongruent context of an unhealthy temptation. Enhanced processing upon the health message reminds consumers of their desired end-state and the context of tempting but unhealthy products reminds them of their current state of craving for pleasurable food. This last state is clearly not in line with the desired end state, which will fuel the desire to reduce the discrepancy (Sela & Shiv, 2009). This way, elaboration upon the health message will facilitate the activation of related health goals, provided that the message is seen as relevant to the health goal. Janiszewski and van Osselaer (2005) discuss this type of goal activation and speak of *"direct activation from consideration of a goal or goal concept"* (p. 219).

**H5:** *Presenting consumers with a health message in an incongruent context has a positive effect on health goal activation*

However, the effect of the health message on health goal activation is not the same in every situation. It is moderated both by the strength of the temptation and by self-control depletion. Consumers with depleted self-control will not make automatic temptation-goal associations. Therefore, it is expected that these consumers will benefit from the positive effect of the health message on goal activation. This effect is expected to exist regardless of the temptation strength because, as established in section 2.4.3, depleted self-control voids the main effect of temptation strength on goal activation.

Those consumers with non-depleted self-control are expected to benefit from the health message only when they are facing weak temptations. Weak temptations do not elicit strong temptation-goal associations and a health message is therefore likely to facilitate goal activation. Strong temptations,

as discussed in section 2.4.1, are already providing strong temptation-goal associations, so no additional effect of the health message is expected.

**H6:** *For consumers with non-depleted self-control, a health message only facilitates health goal activation for weak temptations. Consumers with depleted self-control benefit from a health message regardless of temptations strength.*

## 3. CONCEPTUAL MODEL

Several factors have been discussed that influence health goal activation. The extent to which health goals are activated is influenced by consumer self-control, the strength of the temptations and by the inclusion of a health message near temptations. In this research, the effect on health goal activation of each of these factors independently, as well as in interaction with each other, is modeled and experimentally tested. The conceptual model presents an overview of the factors and the direction of their influence on goal activation, see Figure 1.

FIGURE 1. CONCEPTUAL MODEL
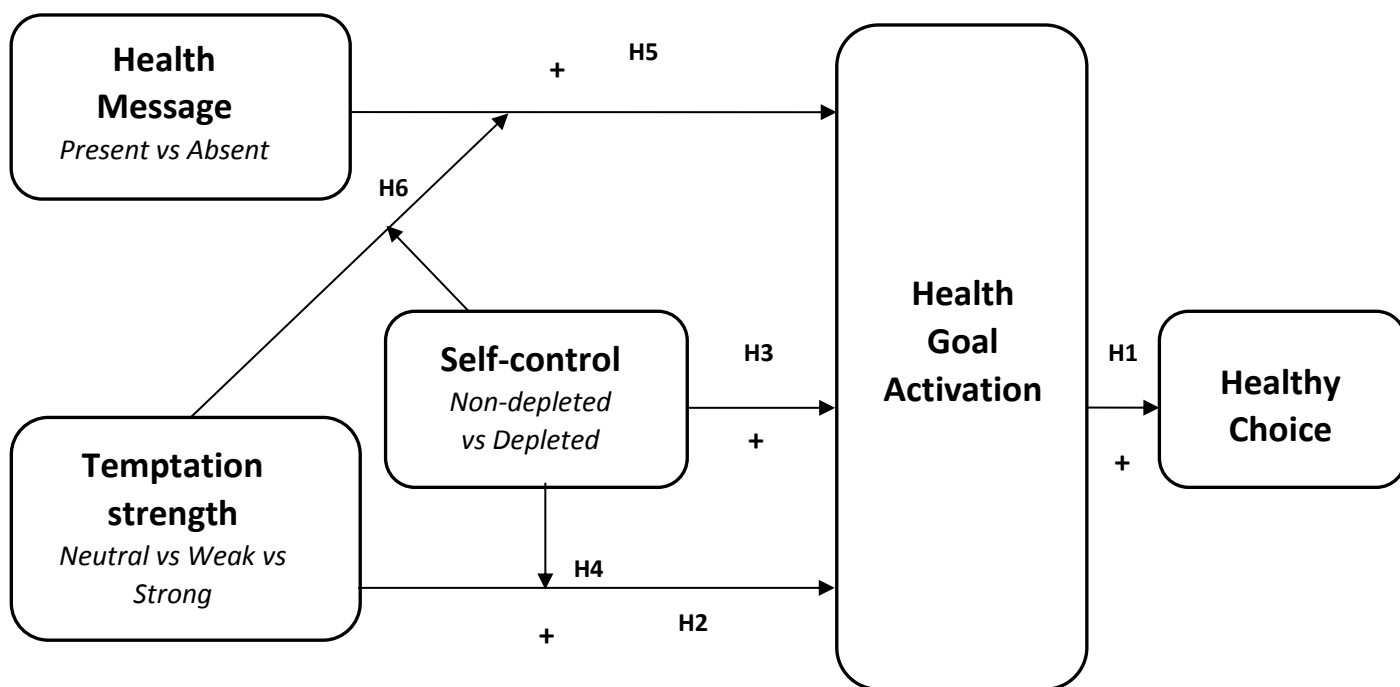
## 3.1 EXPECTED FINDINGS

The expected influence of the experimental factors on health goal activation has been displayed in the two figures below.

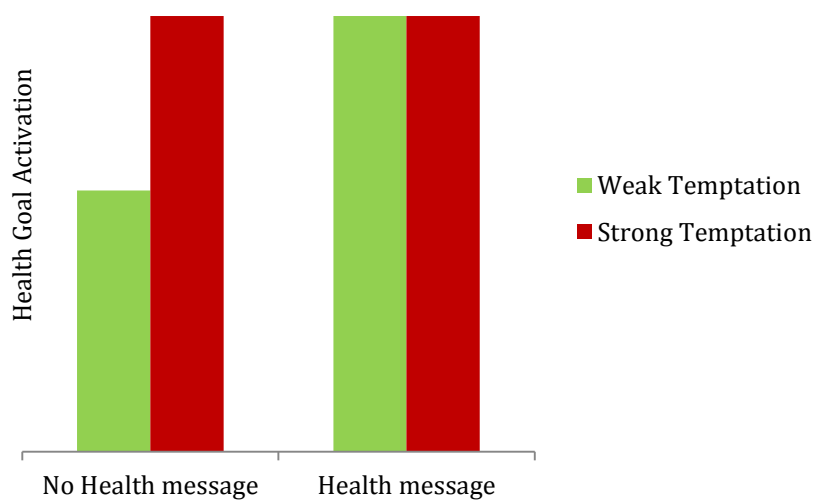FIGURE 2. HEALTH GOAL ACTIVATION FOR DEPLETED SELF-CONTROL
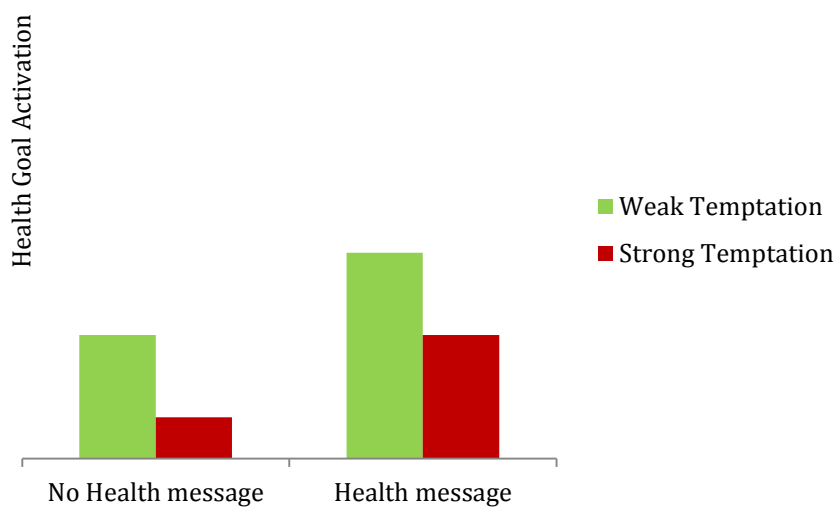


FIGURE 3. HEALTH GOAL ACTIVATION FOR NON-DEPLETED SELF-CONTROL

## 4.  METHOD

### 4.1    PARTICIPANTS

A total of 243 students participated in the experiment. Incomplete responses were excluded (N = 4) as well as responses of participants who watched less than 75% of the attention control video, as measured by the page timer (N = 8). People with dyslexia performing a lexical decision task have slower reaction times to words as well as pseudo words and make a greater number of errors (Taroyan & Nicolson, 2009). Therefore, participants who indicated that they were dyslectic were excluded from the analysis (N = 5). Participants with allergies that could (potentially) conflict with the ingredients used in the depicted recipes or product choices were excluded (N = 11). The remaining sample contained 215 participants, of which 146 were female and 69 were male. Average age was 20.89 years (SD = 2.2).

### 4.2    DESIGN

A 2 x 2 x 3 design was used, making a total of 12 experimental conditions. The conditions are (presence of health message:  yes vs no) x (self-control: depleted vs non-depleted) x (temptation strength: neutral vs weak vs strong). The influence of these conditions on health goal activation and subsequent choice for health/unhealthy products were measured.

*Self-control depletion*

To make sure that a groups of participants can be compared that differ in the amount of self-control they can exert, a self-control depletion task was used. A task was chosen that is similar to the ones used in previous research (DeWall, Baumeister, Stillman, & Gailliot, 2007; Schmeichel, Vohs, & Baumeister, 2003). On the pretext of a character judgement task, all participants watched a 6-minute video of a woman being interviewed. No audio-track was present in the video. In the video, random irrelevant one-syllable words were displayed (each for 10 seconds) to the right side of the interviewee. Participants in the depletion condition got explicit instructions *not* to read the words

while watching the video. Participants in the control (non-depletion) condition were not asked to avoid reading the words. After the video, participants were asked several cover-questions about their impressions of the woman's character. Manipulation-check questions were asked about the number of words they read and the effort they put in *not* to read the words.

The video was obtained from youtube (Baumeister, 2008). See appendix A for a screenshot of the video and the instructions of the depletion task.

*Temptation Strength*

Temptation strength (neutral vs weak vs strong) was manipulated by showing two pages of the Allerhande food magazine. In the strong temptation condition, the page on the left displayed a recipe for a very tempting chocolate pie. In the weak temptation condition, a recipe for a less tempting apple cake was displayed. In the neutral condition, an info-page for a kitchen appliance was shown, styled exactly the same as the recipe pages. Both recipes displayed a glossy picture of the end result, the neutral page had a stock photo of the kitchen appliance. See appendix B for screenshots of the temptation pages and the neutral page. The two recipes were pre-tested to ensure that both are attractive enough to present a temptation, while the pie in the strong temptation condition is more attractive than the cake. A pretest among students (N=10) showed that the apple cake (M = 4.40) and the chocolate pie (M = 6.20) were indeed both attractive enough to present a temptation, with the chocolate pie being more attractive than the apple cake (on a 7-point likert scale).

To hide the purpose of the exposure to the Allerhande pages, participants were asked a few questions about the recipe. They were asked to indicate whether the recipe would be suitable for different groups (e.g. friends, family)  and whether they think the recipe is suitable for different occasions (birthdays, weddings etc.).

*Health Message*

In the health message condition, the right page of the Allerhande magazine (next to the temptation pages) displayed an advertisement of the Dutch semi-governmental institution 'Voedingscentrum'. The ad displayed a health message in the form of an advertisement for a new smartphone app. The app helps you eat healthily by giving tips about eating healthy foods in different environments. A pretest was used to ensure that the health message is seen as relevant to the goal of eating healthy.

Ten students were asked to write down the first keywords that came to mind when they saw the health message. Of those ten students, eight mentioned one or more of the following health related keywords: 'gezond' (6x), 'gezondheid' (3x) and ' bewust eten' (1x).

In the no-message condition, an irrelevant page (colophon) was displayed. See appendix B for screenshots of the health message and the colophon.

## 4.3     PROCEDURE

Participants entered the experiment room and were welcomed by the experimenter. The experimenter asked participants to read a consent form and to wait until there was a free spot at one of the computers. In the consent form, participants were briefed on the tasks they need to perform and the average time it would take them. They were reminded of the possibility to stop with the study when they would not feel comfortable anymore. After giving consent, participants got a participant number and were seated behind a computer. Participants were placed randomly in one of the experimental conditions. Conditions rotated throughout the day to get an even number of participants and to rule out possible time-of-day effects.

First, participants watched the self-control depletion video. After watching the video, some questions were asked to disguise the purpose of the depletion task. Next, participants were subjected to one of the temptation conditions. They were given an unrelated task to disguise the true purpose of seeing the temptation. Participants were instructed to signal the experimenter upon completion of these questions. They would then be seated behind a different computer that had a lexical decision task (LDT) installed. Some would have to wait a few minutes for a free spot, as only five computers were available for the LDT. After being seated, participants performed the LDT, making choices between words and pseudo-words. After finishing the LDT, participants returned to their original computer and were asked to make a number of choices between pairs of products. Each pair consists of a healthy and an unhealthy food product. Before they made their choices, participants were told that they could take home one of the products they chose. When finished choosing, participants completed a survey and reported to the research assistant. All participants got to take home one of the products they chose during  the product choice task. They were debriefed by the research assistant and signed a form indicating that they participated in the study.

## 4.4      MEASUREMENTS

*Health Goal Activation*

A Lexical Decision Task (LDT) was used to measure health goal activation, in similar fashion as in previous goal activation research (Fishbach et al., 2003; Geyskens et al., 2008; Kroese, Evers, et al., 2011). The LDT was designed using the software program Inquisit (Millisecond-Software, 2012).

In the LDT, participants were presented with a sequence of words on their computer screen. They were asked to press one or another key depending on whether the word was a real word or a non-word.  For each trial, an asterisk appeared in the middle of the screen for 900 milliseconds, followed by a display of the stimulus word that lasted 250 milliseconds. After this, the screen stayed blank until input from the participant was received, which in turned prompted a new trial. To familiarize the participants with the task, participants were first asked to perform 10 practice trials that included an equal number of words and non-words. These trials ensured that they fully understood the task and that their motor performance reached a stable level (Fazio, 1990).

Four health related  target words were used ('gezond', 'fit', 'gezondheid' and 'vitaal'), randomly presented among the neutral words. The dependent variable was the mean reaction time to the health related target words. Significantly lower reaction times for health goal related words indicated health goal activation.

Commonly used Dutch words were chosen as neutral words, all with a maximum of three syllables. The pseudo-words were generated using pseudo-word generator (Wuggy; Keuleers and Brysbaert (2010). Based on the real words the application generated non-words that are matched on the number of syllables, sub syllabic structure and transition frequencies of the real words (e.g. 'toetsenbord' and ' toeltenbald'.  The actual tasks consisted of 120 trials, half of which were non-words and the other half real words. The great number of trials was chosen to 'hide' the health related words, so the true purpose of the LDT could not be guessed. It also greatly reduced the chance that the health words would serve as primes, thereby influencing the product choice task of the experiment.

Latency measurements can produce great variability, as it requires participants to be accurate as well as quick in their response. Not every individual might have the commitment and attention to do so. To reduce the potential noise in the latency measurements as much as possible, the recommendations made by Fazio (1990) were put in practice. Participants were given instructions

that detailed how they should give their responses, stressing the importance of responding quickly as well as accurately. See appendix C for the specific set of instructions used in the experiment.

The participants in this research responded incorrectly on 7.5% of the 120 trials (not including practice trials). According to Fazio (1990) this is below the error rate that would arise suspicion (>10%). As the trials consisted of objectively correct and incorrect answers and were relatively easy to answer, it is likely that incorrect trials are the result of mistakes. The latencies of incorrect responses are hard to interpret and are therefore not included in the analysis.

The reaction times for the neutral words provided a baseline measure for the target words. They were used as a covariate in the analyses of the reaction times. This reduced the amount of error variance that needs to be taken into account (Fazio, 1990; Geyskens et al., 2008). Because the latency data were not normally distributed, reaction times were log-transformed before the data was analysed.

To reduce the influence of outliers, participants that had a mean reaction time more than three standard deviations away from the overall mean were excluded (N = 1). Furthermore, reaction times to single items that deviated more than three standard deviations from the participant mean were excluded from the analyses (361 items, 1.5%).

*Product Choice*

After watching the video and seeing the temptation, participants were asked to make a series of four choices, each between two pairs of products shown on a computer screen. The pairs consisted of one healthy product (e.g. a banana) and one unhealthy product (e.g. a chocolate chip cookie). Participants were also asked to indicate how strongly they preferred the product they chose by using a slider. Before they began choosing, participants were told that they could take home one of the chosen products. By linking the choices to real consequences, the choices were made more relevant and realistic. As the dependent variable, the amount of (un)healthy choices was measured for each experimental condition.

The choice between the product pairs was pretested among students (N=12) to ensure that the difference in popularity does not lead to ceiling effects. See Figure 4 for the results of this pre-test and appendix E for all the pictures used in the product choice task.

Some participants made their choice for one of the products only by using the slider indicating their preference. For those participants, it was decided to code their choice according to their preference, as incongruence between preferences and choice was very low (0.4%) among other participants. In cases where preference was neutral, no choice was recorded.

FIGURE 4. PRETEST OF CHOICE PREFERENCE IN PERCENTAGES
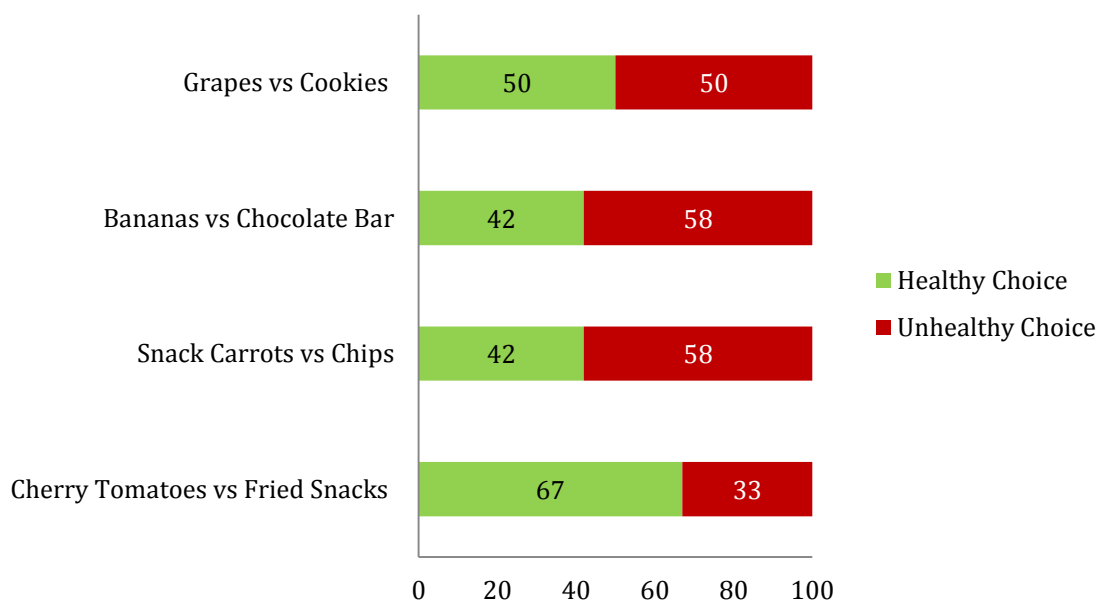


*Health Goal Importance*

The importance of health goals was measured by two items (e.g. 'staying in good health is important for me'), with answers on a 7-point likert-scale ranging from *strongly disagree* to *strongly agree*. The scale had an acceptable reliability, Cronbach's $\alpha$ = .72.

*Self-control Success*

Successful self-control was measured by a translated version of the brief self-control scale from Tangney (2004), with answers on a 7-point likert-scale ranging from *strongly disagree* to *strongly agree.* The translation is courtesy of de Wilde (2005) and Katib (2009) (see appendix D, 13 items, e.g. 'Ik ben goed in het weerstaan van verleidingen'). The scale had a good reliability (Cronbach's $\alpha$ = .81).

*Attractiveness of the Temptation*

The attractiveness of the temptation was measured by two items (e.g. 'Dit recept is verleidelijk'), with answers on a 7-point likert-scale ranging from *strongly disagree* to *strongly agree*.  The scale had a good reliability, Cronbach's α = .82

*Restraint Scale*

Participants filled in a translated version of the Restraint Scale (Polivy Herman,& Warsch, 1978) to control for restrained eaters (appendix D,  9 items, e.g. 'Heb je een schuldgevoel nadat je teveel hebt gegeten?'). The scale had an acceptable reliability, Cronbach's α = .70.

*Food Allergies*

Participants were asked to mention if they had any food allergies. Those who answered 'yes' were asked to detail their allergies in a follow-up question.

## 5.   RESULTS

### 5.1      MANIPULATION CHECKS

*Self-Control Depletion*

After watching the video all participants answered questions about the words that appeared in the video. An Analysis of Variance (ANOVA) shows that participants in the depletion condition (M = 2.04, SD = .39) reported reading fewer words than those in the non-depletion condition (M = 2.66, SD = .60), F(1, 214) = 81.24, p < .001) (4-point scale). This indicates that those in the depletion condition were successful in avoiding reading the words.  However, participants in the depletion condition (M = 3.61, SD = 1.45) reported no significant extra effort to avoid reading the words compared to those in the non-depletion condition (M = 3.85, SD = 1.40), F(1, 214) = 1.52, p > .05 (6-point scale).

*Temptation Manipulation*

Temptations were presented in the form of recipes, with an apple cake being the weak temptation and a chocolate pie being the strong temptation. A kitchen appliance was used for the neutral condition. Temptation manipulations were successful. On a 7-point likert scale, both the apple cake (M = 4.91, SD = 1.31) and the chocolate pie (M = 6.13, SD = 0.87) were seen as tempting. Crucially, an ANOVA shows that the chocolate pie was viewed as a significantly stronger temptation than the apple cake, F(1, 141) = 42.51, p < .001. See Figure 5.

FIGURE 5. TEMPTATION SCORES
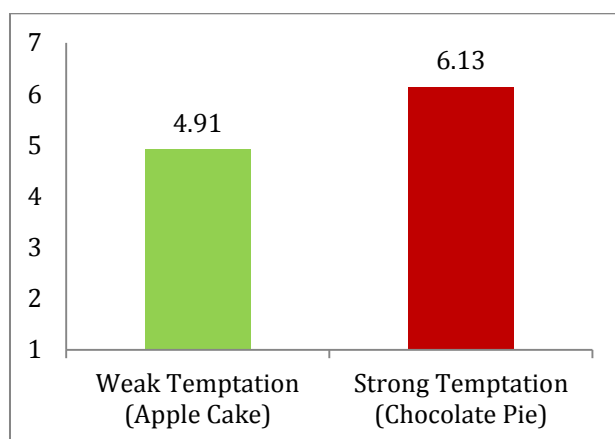
The chocolate pie (M = 1.90, SD = .77) was also seen as significantly less healthy than the apple cake (M = 3.01, SD = 1.20), $F(1, 141) = 43.45$, $p < .001$.

Participants spent an average of 36 seconds looking at the temptations page. A factorial ANOVA on the average time spent on the temptations page showed no significant differences between the experimental factors, all p's *ns*.

*Self-control Scale and Restraint Scale*

Using a factorial ANOVA with all three factors, no significant differences in responses to the self-control scale were found, all p's *ns*. Also, no effect of the experimental factors was found for responses to the Restraint Scale, all p's *ns*. This indicates that the randomization was successful.

*Health Goal Importance Scale*

A factorial ANOVA shows that the experimental factors did not have a significant effect on the importance of health goals as measured by the health goal importance scale, all p's *ns*. Again, this is an indication of successful randomization.

## 5.2     HEALTH GOAL ACTIVATION

In this section, the influence of the experimental factors on health goal activation will be presented. Health goal activation was measured by the reaction times to health related target words. Thereby, lower reaction times indicate stronger goal activation. All analyses were performed on the log-transformed reaction times, but the means are presented in milliseconds to facilitate interpretation. Reaction times to the health related target words were analysed using the reaction times to neutral words as covariates. A factorial Analysis of Covariance (ANCOVA) indicates that the neutral words are a significant covariate, $F(1, 202) = 318.02$, $p < .001$, $r = .77$.

A factorial ANOVA testing the effect of the experimental factors on the reaction times to neutral words did not reveal significant differences, all p's > .13, see Table 1. This confirms that randomization was successful.

Hypothesis 2 states that health goal activation will be positively influenced by the strength of the temptation. Using a factorial ANCOVA, it was found that temptation strength does not significantly influence health goal activation, $F(2, 202) = 0.64$, *ns*. Hypothesis 2 therefore cannot be accepted.

Participants that have non-depleted self-control should be better able to activate health goals, according to hypothesis 3. However, no significant differences were found in health goal activation between participants with depleted self-control and those with non-depleted self-control, $F(2, 202) = 1.36$, *ns*.

Hypothesis 4 stated that an interaction effect was expected to be found between depletion and temptation strength, whereby self-control depletion would void the positive effect of temptation strength. No significant interaction effect was found, $F(2, 202) = 0.07$, *ns*. This means hypothesis 4 cannot be accepted.

The presence of a health message instead of a neutral message next to the temptation did not significantly influence health goal activation, $F(2, 202) = 0.00$, *ns*. Therefore, hypothesis 5 cannot be accepted.

Hypothesis 6 predicted that the relation between health message and temptation strength would be differently affected by the state of depletion consumers are in. This three way interaction was not found to be significant, $F(2, 202) = 0.48$, *ns* (see Table 1 for all interactions). Therefore, hypothesis 6 cannot be accepted.

For an overview of the (non-transformed) reaction times in all experimental conditions, see Figure 6. A complete overview of the ANCOVA results can be found in Table 1.

TABLE 1. EFFECTS OF THE EXPERIMENTAL FACTORS ON TARGET AND NEUTRAL WORDS

| Factor | Health Related (Target) Words | | | Neutral Words | | |
|---|---|---|---|---|---|---|
| | df | F-value | p | df | F-value | p |
| Covariate (Neutral Words) | 1 | 318.02 | .00* | | | |
| Temptation Strength | 2 | 0.64 | .53 | 2 | 0.59 | .55 |
| Depletion | 1 | 1.36 | .25 | 1 | 2.34 | .13 |
| Health Message | 1 | 0.00 | .96 | 1 | 0.01 | .91 |
| Temptation Strength* Depletion | 2 | 0.07 | .94 | 2 | 0.18 | .84 |
| Temptation Strength* Health Message | 2 | 1.16 | .32 | 2 | 0.41 | .66 |
| Health Message* Depletion | 2 | 0.03 | .86 | 2 | 0.8 | .37 |
| Temptation Strength* Depletion* Health Message | 2 | 0.48 | .62 | 2 | 0.52 | .59 |

Note: * = p < .001

FIGURE 6. MEAN REACTION TIMES PER CONDITION (IN MILLISECONDS) WITH STANDARD DEVIATIONS
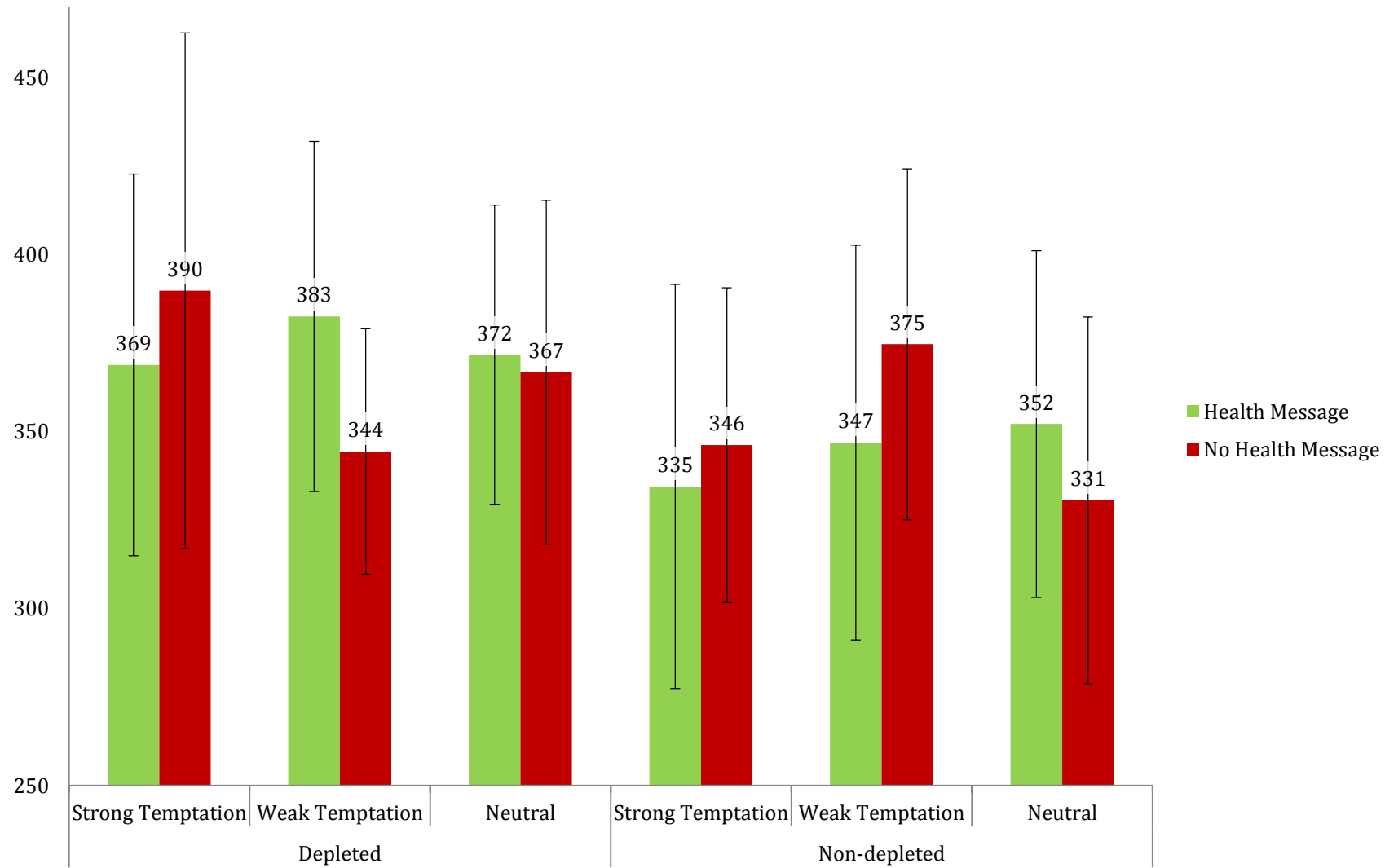
## 5.3     PRODUCT CHOICE

Hypothesis 1 states that the strength of health goal activation will positively predict healthy choices. This hypothesis was tested using a simple regression predicting the number of healthy choices from the reaction time to health related target words. Reaction time to health related words did not significantly predict healthy choices, $\beta$ = -.38, t(213) = 1.60, *ns*. Therefore, hypothesis 1 cannot be accepted.

On average, 41% of the choices were for healthy products. There were some notable differences for the number of healthy choices between the different product pairs. Bananas were the least popular choice among the healthy products, cherry tomatoes the most popular. See Figure 7.

FIGURE 7. PRODUCT CHOICES IN PERCENTAGES
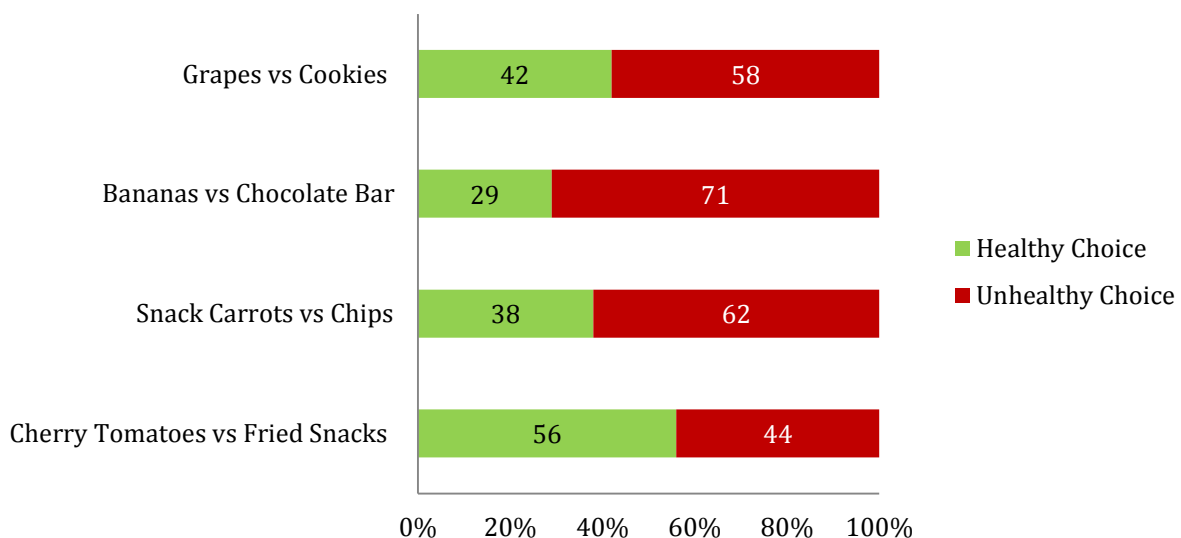


To test the effect of the factors temptation strength, depletion and health message on the number of healthy product choices, a factorial ANOVA was used that included those three factors. The experimental factors did not significantly influence healthy choices, all p's *ns.* Table 2 presents the results of the factorial ANOVA for each factor, including the interactions between the factors. An overview of the mean number of healthy choices per condition is displayed in Figure 8.

*Real Choices (Take Home Choice)*

At the end of the study, participants were asked whether they chose chocolate or a bananas in the 'product choice study'. They subsequently received the product they reported. This choice was noted down and checked against the choice they made on the computer. Eight participants chose to take home a different product than their original choice on the computer. Five participants switched from banana to chocolate, three made the switch from chocolate to banana.

TABLE 2. INFLUENCE OF EXPERIMENTAL FACTORS ON THE NUMBER OF HEALTHY CHOICES

| Factor | Healthy Choices | | |
|---|---|---|---|
| | df | F-value | p |
| Temptation Strength | 2 | 1.05 | 0.35 |
| Depletion | 1 | 0.26 | 0.61 |
| Health Message | 1 | 0.03 | 0.85 |
| Temptation Strength * Depletion | 2 | 0.66 | 0.52 |
| Temptation Strength * Health Message | 2 | 1.01 | 0.37 |
| Health Message * Depletion | 1 | 0.83 | 0.36 |
| Temptation Strength * Depletion * Health Message | 2 | 0.70 | 0.50 |

FIGURE 8. MEAN NUMBER OF HEALTHY CHOICES WITH STANDARD DEVIATIONS
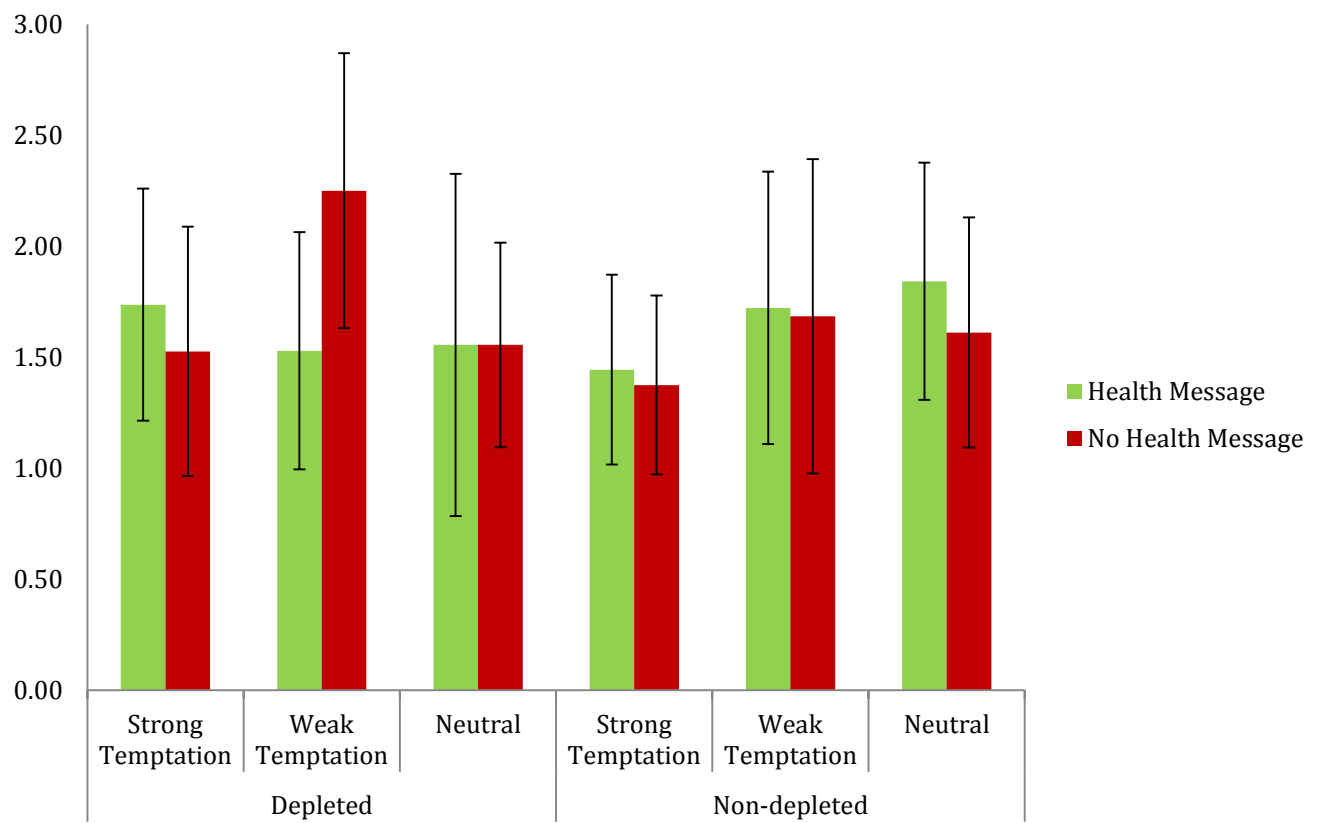
*Product Choices vs Self-report Scales*

Higher scores on the health importance scale correlated positively with the number of healthy choices participants made, but only with a small effect size, $r$ = .22, p < .01.

Higher scores on the self-control scale also correlated positively with the number of healthy product choices participants made, albeit with a small effect size, $r$ = .13, p < .05.

Higher scores on the restraint scale did not significantly correlate with the number of healthy product choices participants made, $r$ = .06, *ns*.

## 5.4     EXPLORATION OF RESULTS

In this section, the results of some analyses are presented that did are not based on the hypotheses of this thesis. They should therefore be interpreted with caution. It was decided to include them because of their possible importance for future research.

*Gender and Health Goal Activation*

An ANCOVA on reaction times with the three experimental factors and gender as independent variables revealed a significant interaction effect between the depletion condition and gender, $F_{(2, 190)}$ = 8.51, p < .01. Female participants were differently affected by the depletion task than male participants. In the depletion condition females had higher reaction times (M = 373, SD = 111) to health related target words than in the non-depletion condition (M = 330, SD = 93), $F_{(1, 190)}$ = 7.28, p < .01. Male participants did not have significantly different reaction times in the depletion condition (M = 367, SD = 81) compared to the non-depletion condition (M = 381, SD = 109), $F_{(1, 190)}$ = 2.87, *ns*. No significant interactions between gender and temptation strength, or gender and health message were found.

The interaction effect between gender and depletion can possibly be explained by a difference in scores on the self-control scale between males and females. Females did indeed score significantly higher (M = 4.05, SD = 0.84) on the self-control scale than males (M = 3.68, SD = 0.79), $F_{(2, 190)}$ =

9.42, p < .01). High (vs low) scores on the self-control scale would then predict a different effect of depletion on reaction times to the target words. This interaction was tested using an ANCOVA on reaction times with the experimental factors as independent variables and the mean-centered scores of the self-control scale as covariate. The self-control scale covariate was found to be only marginally significant, $F_{(2, 202)} = 3.43$, p = .067. No significant interaction effect between depletion condition and the self-control covariate was found, $F_{(2, 202)} = 0.37$, *ns*. Therefore, it is not possible to explain the gender-depletion interaction from the different scores on the self-control scale.

Females (M = 2.13, SD = 0.43) also scored higher on the restraint scale than males (M = 1.80, SD = .44), $F_{(1, 213)} = 26.65$, p < .001. It was therefore decided to test whether the gender-depletion interaction could be explained by differences in restraint eating between males and females. An ANCOVA on reaction times was used with the experimental factors as independent variables and the mean-centered scores of the restraint scale as covariate. The restraint scale covariate was found to be non-significant, $F_{(2, 202)} = 1.51$, *ns*. Also, no interaction effect between depletion and the restraint scale was found, $F_{(2, 203)} = 0.00$, *ns*. Thus, the gender-depletion interaction cannot be explained by the differences in restraint eating. Neither can differences in health goal importance explain the gender-depletion interaction, as scores on the health importance scale for females (M = 6.12, SD = 0.66) and males (M = 6.00, SD = 0.74) did not differ significantly, $F_{(1, 213)} = 1.68$, *ns.*

Further elaboration upon a possible gender effect can be found in the discussion section of this thesis.

*Gender and Product Choices*

A factorial ANOVA shows that females made more healthy choices (M = 1.76, SD = 1.10) than males (M = 1.43, SD = 1.15), $F_{(2, 202)} = 4.50$, p < .05. However, the interaction between gender and depletion that was found for health goal activation was not found for the amount of healthy product choices, $F_{(2, 202)} = 1.98$, *ns.*

*Effects of Experimental Factors on Healthy Choices per Product Pair*

Four different product pairs were used in the product choice test to measure the number of healthy choices participants would make. As evident from Figure 7, the number of healthy choices varied considerably between the product pairs. It was therefore decided to check whether the experimental

factors affected the number of healthy choices differently for the different product pairs. Four logistic regressions were carried out with the product pairs as dependent variables and the experimental factors as predictors. No significant predictors were found for the choice pairs 'grapes vs cookies', 'chips vs carrots' and 'cherry tomatoes vs bitterballen'. These product pairs were not significantly affected by the experimental factors.

However, for the product pair 'chocolate vs bananas' it was found that depletion significantly predicted the choice for bananas or chocolate in the product choice test on the computer. 36% of participants in the depletion condition chose a banana, versus only 22% of participants in the non-depletion condition. This effect is the opposite of what was expected of depleted participants. See the discussion section for further elaboration.

Health message and temptation strength did not significantly predict choice for bananas or chocolate. No significant interaction effects were found. See Table 3 for the full results of the logistic regression.

TABLE 3. PREDICTORS FOR CHOICE BETWEEN BANANAS OR CHOCOLATE

| | | 95% confidence interval for exp b | | | |
|---|---|---|---|---|---|
| | B (SE) | Lower | exp b | Upper | p |
| Included | | | | | |
| Depletion | -0.68 (0.31) | 0.28 | 0.51 | 0.93 | .03 |
| Health Message | -0.15 (0.31) | 0.47 | 0.86 | 1.57 | .62 |
| Weak Temptation vs Neutral (1) | 0.72 (0.38) | 0.97 | 2.04 | 4.32 | .06 |
| Strong Temptation vs Neutral (2) | 0.37 (0.39) | 0.68 | 1.44 | 3.09 | .34 |
| Depletion * (1) | 1.41 (0.80) | 0.86 | 4.09 | 19.45 | .08 |
| Depletion * (2) | 0.78 (0.80) | 0.45 | 2.18 | 10.55 | .33 |
| Health Message * (1) | -0.91 (0.80) | 0.08 | 0.4 | 1.91 | .25 |
| Health Message * (2) | 0.07 (0.81) | 0.22 | 1.08 | 5.25 | .93 |
| Health Message * Depletion | -0.24 (0.65) | 0.36 | 1.27 | 4.52 | .71 |

$R^2$ = .07 (Cox & Snell), .10 (Nagelkerke). Model $\chi 2$ (9) = 14.79, p = .097

# 6. DISCUSSION

This research set out to study the activation of health goals by health messages in those situations where a lack of self-control and/or a lack of temptation strength would predict no goal activation. The experiment that was conducted did not confirm the hypotheses as laid out in the theoretical overview. There was no significant influence on health goal activation and healthy choices for the factors temptation strength, self-control depletion and the presence of a health message. In this discussion section we will first discuss the findings of this study. Subsequently, the limitations will be addressed and recommendations for future research will be made.

*Depletion*

Depletion of self-control did not have an effect on health goal activation and healthy choice in this study. For product choice, this is in contrast with previous research, where an increase in unhealthy choices was found when consumer self-control was depleted (Baumeister, Sparks, Stillman, & Vohs, 2008). As for the influence of depletion on health goal activation, this study is on unchartered terrain, as previous research used self-reported levels of successfulness in self-control instead of a depletion manipulation (Fishbach et al., 2003). Although no general effect of depletion on healthy choice was found, the specific choice for bananas was higher amongst depleted participants than amongst non-depleted participants. Although this result is hard to explain, it is at least an indication that the expected negative effect of self-control depletion on healthy choices might not hold true for all product choices.

Also, the gender effect as discussed in section 5.4 cannot be left out here. Unlike males, females had higher reaction times to the health related words when their self-control was depleted. There is no reason to believe that females react differently to the depletion task than males, and previous studies that used the same depletion task did not report gender differences (DeWall et al., 2007; Schmeichel et al., 2003). The gender-depletion interaction could not be explained by differences between males and females in the importance of their health goals, self-control success or restraint eating. It must be noted that most previous studies that found temptation-goal activation effects for food temptations had only female participants (Geyskens et al., 2008; Kroese, Evers, et al., 2011) and did not manipulate self-control resources. It is therefore recommended to further explore possible gender differences in future temptation-goal activation research.

Another possible explanation for the lack of a depletion effect may be the conservation of self-control resources. People have been known to conserve self-control resources when they expect the need to exert self-control in the (near) future (Hagger et al., 2010; Muraven & Baumeister, 2000).

Participants knew that they would participate in what was called a 'series of small experiments' during 20-25 minutes with the video depletion task being the first of the series. It is possible that participants chose to conserve self-control during the depletion task because they expected that the subsequent tasks would also require the use of self-control. If they did conserve self-control during the depletion task, this could have inhibited the depleting effect of that task.

*Temptations*

No significant influence of temptation on health goal activation and product choice was found in this study. This is in contrast with previous studies, where temptation was found to influence goal activation (Fishbach et al., 2003; Kroese, Evers, et al., 2011). A possible explanation for the lack of an effect may be found in the amount of time between temptation exposure and goal activation measurement. The study of Fishbach (2003) used a experimental setup with the temptation being primed in the LDT itself. This way, the amount of time between temptation and goal activation measurement was minimal. The study of Kroese (2011) used a temptation manipulation that was comparable with the current study, but time between temptation exposure and goal activation measurement was minimized. In this study, participants answered a number of filler questions between the temptation exposure and the LDT, creating a 2-5 minute time gap before the goal activation measurement. This time gap itself will not likely have hurt the accessibility of the health goals, as active goals are fairly resistant to decay (Förster, Liberman, & Friedman, 2007). But it cannot be excluded that the filler questions functioned as cues that activated different goals. The more recently activated goal could then have suppressed the accessibility of the previously activated health goal (Förster et al., 2007; Hodgetts & Jones, 2006).

At this point, it might do good to refer back to the current debate on priming research (and social psychology in general) and address some of the concerns that could potentially arise when reading this study. A famous study of Bargh (1996) concluded that people walked slower after being primed with a stereotype of 'old age'. Recently, it was found that the experimenters' beliefs about the outcomes may have influenced the measurements, rather than the priming itself (Doyen, Klein, Pichon, & Cleeremans, 2012). In this study, the dependent variables were all measured in a digital survey and in a lexical decision task on a computer. It was not possible for the experimenter to have any influence on the measurements. As for concerns regarding 'data fishing', this study reported only results related to the pre-determined hypotheses in the main body of the result section. A separate

section (Exploration of Results) was used to report findings that were not hypothesized. This section starts with a warning that urges to take caution with the reported results.

*Product Choice*

There were rather large differences in the choice distributions of the pairs of healthy/unhealthy products. Especially the chocolate/banana choice option was heavily weighted towards the unhealthy (chocolate) option. Although chocolate also scored a little better than banana in the pre-test, the difference was not this great. Participants were not told that chocolate and bananas were the take-home products, but there is a possibility that some knew in advance. The products were handed out in the same room where participants were seated behind their computers. Although participants were asked to put away the product discretely, chances are that others observed chocolate or bananas being handed out. Also, future participants might have seen people consuming the products in the university building. Of course, this could have had influence on the product choices they made. Consumers have been found to make trade-offs between two goals (e.g. 'health' and 'pleasure') by balancing their choices in sequential choice settings (Dhar & Simonson, 1999). If participants knew in advance that they would actually get either chocolate or a banana, they could fulfil the 'pleasure' goal by choosing chocolate and balance 'safely' by choosing more healthy options in the other pairs. This could explain the high percentage of choice for the chocolate.

## 6.1 LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

*Lexical Decision Task*

The physical research environment was not ideally suited for the Lexical Decision Task. The LDT was quite a lengthy task requiring a high focus. The LDT computers were facing a window, which may have proven to be a distraction for some participants. And although noise levels were generally quite low, they may still have been distracting for a task that requires a high amount of concentration. This could be possible explanations for the relatively high standard deviations of the reaction times when compared to SD's observed in similar LDT's (Geyskens et al., 2008; Kroese, Evers, et al., 2011). For future research it would be recommended to have a LDT take place in a separate room, if possible with LDT-participants being physically separated from each other (e.g. with folding screens).

*Health Message*

The health message used in this experiment did not have an effect on goal activation or product choice. A possible explanation could be that the health message was not prominent enough to elicit an effect. To avoid giving away the true purpose of the study, the health message was deliberately chosen not to be too conspicuous. The choice was made not to include a manipulation check for the health message, again because this would have attracted unwanted attention to the true nature of the study. It was therefore not possible to check if the health message might have been too subtle. This problem can be addressed in future research by conducting more extensive pre-tests of the temptation-health message combinations.

*Actionability of Temptations*

The temptations used in this study as experimental manipulations were 'paper' temptations, as they were not directly accessible to the participants. No action was possible upon viewing the temptation, so no (positive or negative) consequences would likely result from a decision to take or leave the temptation, as this decision did not need to be made. Processes associated with indulging on temptations, like anticipatory guilt or regret (Laran, 2010; Laran & Janiszewski, 2009) did not likely play a role in this research but are important in real life decision making. It would therefore be interesting to see future research with a similar research setup that includes actionable temptations.

## CONCLUSION

This study did not find the hypothesized effects of self-control depletion, temptation strength and health messages on the activation of health goals and the choices for healthy products. However, there were some interesting findings that might indicate that the depletion of self-control resources has a different influence on health goal activation for females than for males. This is especially interesting because previous research on the relation between food temptations and health goal activation involved only female participants. It is therefore recommended that future research in this field also includes male participants. Future research would do well to consider and further examine a possible gender effect for situations where depleted consumers encounter food temptations.

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## APPENDICES

**Appendix A**
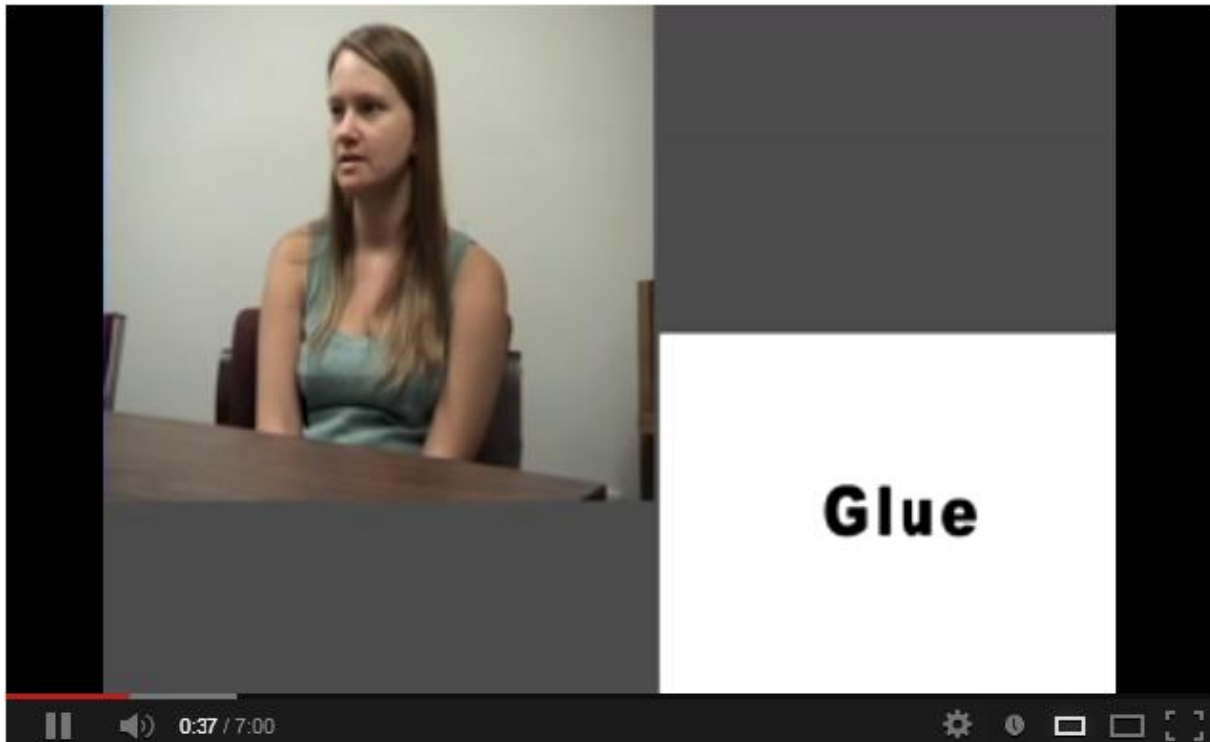


*Instructions Self-Control Depletion Task*

---

Dit is een onderzoek dat gaat over hoe mensen een eerste indruk vormen op basis van het uiterlijk van een persoon.  Je krijgt een video te zien waarin een vrouw geïnterviewd wordt. Het geluid ontbreekt bij deze video, zodat je je kunt richten op het beeld.

Na het bekijken van de video word je gevraagd om op basis van het beeld enkele karakteromschrijvingen te geven van de vrouw in de video. Let dus goed op.

[Tijdens de video verschijnen er woorden aan de rechterkant van het beeld. Ik wil je vragen deze woorden niet te lezen. Mocht je blik toch vallen op een van de woorden, richt je blik dan zo snel mogelijk weer op de vrouw!]

---

The bracketed sentences were only present in the depletion condition.

**Appendix B**

FIGURE 9. NEUTRAL CONDITION WITH HEALTH MESSAGE



FIGURE 10. STRONG TEMPTATION - NO HEALTH MESSAGE

FIGURE 11. WEAK TEMPTATION WITH HEALTH MESSAGE

**Appendix C**

*Instructions Lexical Decision Task*

---

Lees onderstaande instructies aub zorgvuldig!

Dit onderzoek gaat over het herkennen van woorden door de hersenen.

In de taak die je zo gaat doen komt er midden in het scherm een '*' te staan, en vervolgens verschijnen er kort een aantal letters in beeld.
Aan jou de taak om zo snel mogelijk te beslissen of de letters een Nederlands woord vormen of niet.

Als de letters een bestaand woord vormen dan druk je op de 'I' toets.

Als de letters GEEN woord vormen dan druk je op de 'E' toets.

Probeer accuraat en zo vlug als je kunt te beslissen.

Eerst ga je een paar keer oefenen. Zorg dat je er klaar voor bent door je vingers op de 'E' en 'I' toetsen te plaatsen.
Druk op de spatiebalk als je klaar bent om te beginnen.

---

*After the practice trials*

---

Het oefenen is nu voorbij en de de taak begint. Ter herinnering:

Als de letters een bestaand woord vormen dan druk je op de 'I' toets.

Als de letters GEEN woord vormen dan druk je op de 'E' toets.

Probeer zo snel en accuraat mogelijk te bepalen of de letters een woord vormen of niet.

Druk op de spatiebalk als je klaar bent om te beginnen.

---

**Appendix D**

*Restraint Scale*

1. Hoe vaak ben je aan het diëten?
2. Wat is het maximum aantal kilo's dat je al eens bent verloren in 1 maand? (uitgezonderd van ziekte)
3. Hoeveel varieert je gewicht in een typische week?
4. Zou een gewichtsschommeling van 2 kg je levensstijl veranderen?
5. Eet je rustiger als er anderen bij zijn en "schrok" je meer alleen?
6. Steek je teveel tijd en denkwerk in je voeding?
7. Heb je een schuldgevoel nadat je teveel gegeten hebt?
8. Hoe bewust ben je je van wat je eet?
9. Hoeveel kg ben je op je maximaal gewicht boven je gewenste gewicht?

*Self-control Scale*

1. Ik ben goed in het weerstaan van verleidingen
2. (R) Slechte gewoontes leer ik moeilijk af.
3. (R) Ik ben lui.
4. (R) Ik zeg soms ongepaste dingen.
5. (R) Ik doe soms dingen die slecht voor me zijn, gewoon omdat ze leuk zijn.
6. Ik weiger dingen die slecht voor me zijn.
7. (R) Ik zou willen dat ik meer zelfdiscipline had.
8. Anderen vinden dat ik een grote zelfdiscipline heb
9. (R) Pleziertjes weerhouden me er soms van mijn (studie) werk af te krijgen.
10. (R) Ik kan me moeilijk concentreren.
11. Ik kan goed werken aan lange termijn doelen.
12. (R) Soms kan ik het niet laten bepaalde dingen te doen, ook al weet ik dat ze verkeerd zijn.
13. (R) Ik doe vaak dingen zonder eerst alle alternatieven te overwegen.

(R) = Reverse Coded.

**Appendix E**

*Product Choices*

FIGURE 12. COOKIES VS GRAPES
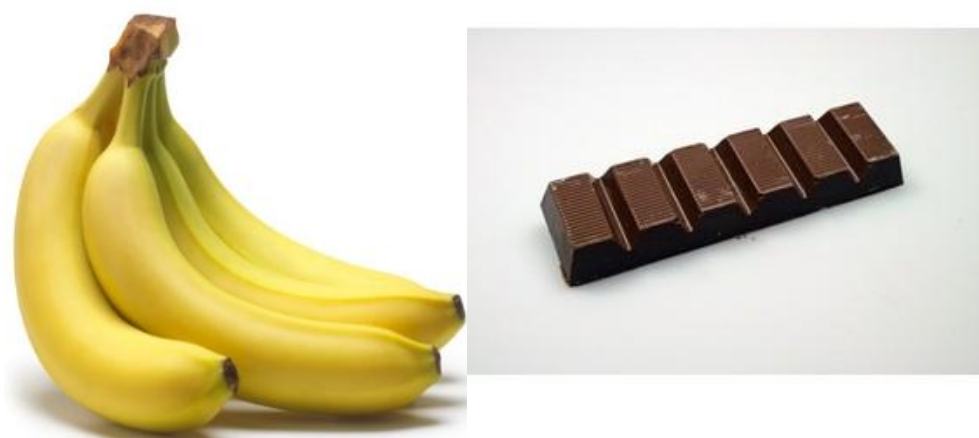
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FIGURE 13. BANANAS VS CHOCOLATE

FIGURE 14. SNACK CARROTS VS CHIPS



FIGURE 15. CHERRY TOMATOES VS BITTERBALLEN