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Attitudes towards others' superior health behavior and their influence on one's own health behavior

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Author: Eva Sturkenboom
Student number: 4141695

1st supervisor: Leslie van der Leer
2nd supervisor: Stephanie Blom

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Abstract:

People make social comparisons to establish an accurate self-image, as well as to maintain a positive self-image. Comparisons with superior others results in threat, especially when the difference with the target seems unattainable. Negative devaluation of a superior other diminishes threat and restores our self-image. This has been found for moral superior others, but it is not known whether it applies to healthier others. The current research therefore tried to show the existence of negative attitudes towards others portraying weight loss behaviors and the mediating effect on health behavior, while also looking at a moderation of assumed competence measured through perceived scientific support of the weight loss methods on the attitudes towards superior others. To examine this model, 120 participants were randomly shown either a scenario of a target using the keto-diet or a scenario of a target using the method of counting calories and exercising to lose weight. The participants had to judge the target on their competence and warmth, which determined the attitude towards the target and the scientific soundness and effectiveness of the dieting method were also judged. Lastly, participants indicated their preferred choice between a healthy and unhealthy prize. The results did not confirm any of the hypotheses, but did show significant results in the opposite of the expected directions. Limitations of the research are discussed, as well as recommendations for future research.

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Introduction

Do you sometimes judge others, simply because they are doing something you are not doing or wished you were doing? Then you might have been engaging in social comparison. Social comparison with similar others can help determine what our abilities are. Humans have a natural drive to evaluate their abilities and opinions through social comparison to form an accurate self-image (Festinger, 1954).

However, social comparisons are not only made with similar others and not only for the benefit of creating an accurate self-image. We also compare ourselves to people that are better or worse off, therefore making upward and downward comparisons. In general, we are prone to upward comparisons (Gerber, Wheeler & Suls, 2018). Wheeler (1966) showed that we tend to compare ourselves with people that are superior when we are allowed to choose who we compare ourselves to. More recently, Buunk, Kuyper and Van der Zee (2005) also found that secondary school students prefer to compare themselves to people who got higher grades. This can lead to self-enhancement in two ways; by believing you are similar to a superior other or by providing a superior example to live up to. Putting yourself in the same category as a superior other also means that you can consider yourself as better than you are, ergo boosting your self-confidence (Collins, 1996). It is also possible to learn from a higher-ranking other and to be motivated by looking up to someone (Lockwood & Kunda, 1997). However, unfavorable upward comparisons can pose a threat to our self-esteem. This especially happens when the difference with the superior other seems great and therefore unattainable (Lockwood & Kunda, 1997). Consequently, people will seek ways to feel better about theirselves and to restore their self-esteem and self-image (Wills, 1981).

When confronted with a threat, people have a greater tendency to compare themselves with someone that is inferior and the bigger this threat is, the more often people will choose someone that is much worse off (Hakmiller, 1966). These downward comparisons can diminish negative feelings: the mood of depressed individuals improved after reading information about others who were also experiencing very negative feelings, while this information did not do much for non-depressed individuals (Gibbons, 1986). People seek comparisons to others that are in the same position or worse-off in order to feel better about themselves.

Not only do social comparisons influence the way we evaluate ourselves, but also how we evaluate others. Comparisons inform us about the abilities of both ourselves and the other person. Our self-assessment influences the way we see others, but the way we perceive others also influences our own assessment (Alicke, 2000). If we see the other as competent, a

downward comparison is more in our favor, since it is not really an accomplishment to be better than an incompetent other. The opposite is also true. An upward comparison is even less favorable when the other person is very competent, because a much-better someone is a much bigger threat to your self-esteem than a just-slightly-better someone. It can therefore be advantageous to (subconsciously) adjust the perception of the other depending on the context in order to maintain or establish a positive self-concept.

Negative evaluations of others are created to diminish the threat of superior others to our self-image (Fein & Spencer, 1997). For example, Cramwinckel, Van Dijk, Scheepers and Van den Bos (2013) found that when participants ate a sausage and were then confronted with another person who refused to eat a sausage, they formed a negative attitude towards this other person. This dislike was not just because the other's behavior deviated from the participants' own behavior or the average behavior, as the other person was disliked even more when the refusal was for moral reasons compared to non-moral reasons. An upward comparison with someone that shows more morality by denying meat poses a bigger threat to one's self-concept than someone who simply denies meat for no reason. People that valued morality more greatly disliked the meat denier even more. This apparent contradiction can be explained by the fact that the threat of not being a morally good person is bigger for people that value morality more greatly (Cramwinckel, Van den Bos & Van Dijk, 2015). This mechanism also occurred when non-vegetarians were asked to think about how vegetarians would judge meat eaters, either before or after the non-vegetarians rated vegetarians. It was shown that non-vegetarians rated vegetarians less positively if they had first considered what vegetarians would think of meat eaters (Minson & Monin, 2012). Rating down the vegetarians counteracted the anticipated moral reproach from the vegetarians and therefore the negative consequence to the self.

This process of devaluation of others has mainly been investigated in the domain of morality. However, there is an indication that this mechanism may also take place in other domains. For instance, research has shown that people generally evaluate attractive people more positively than unattractive people (Eagly, Ashmore, Makhijani & Longo, 1991; Jackson, Hunter & Hodge, 1995). However, this positive bias seems to only exist when (heterosexual) participants look at the opposite gender (Agthe, Spörrle & Maner, 2010). Attractive others posed a social threat to participants from the same gender and consequently were evaluated lower than people from the opposite gender for job openings and scholarship positions. This negative bias only existed when moderate attractive participants were judging highly attractive others, it did not exist for highly attractive participants. Highly attractive

participants are likely not threatened by (equally) attractive individuals and thus do not have a need for devaluing others. Negative evaluation of others will only happen when the attractiveness of others is perceived as a threat. It appears likely we derogate others who make us feel like we are lacking in an area we value.

Related to the value of being attractive, being healthy and in good shape are important principles for many people. For example, losing weight and exercising occupy high positions in the list of new year's resolutions (Norcross, Mrykalo & Blagys, 2002). Yet, maintaining and achieving these health goals is difficult, as fifty percent of Dutch adults are moderately or heavily overweight (CBS & RIVM, 2019). Recently, Tiggemann and Anderberg (2020) asked participants to compare themselves to either real images, idealized images, or real images next to idealized images. Participants' body dissatisfaction decreased when they compared themselves to real images or real images next to idealized images. However, it increased when they compared themselves with idealized images. Although the superior other in this instance was not 'real', the comparison to a superior other led to an increase of body dissatisfaction. Since we value losing weight and being in shape, it is likely that we make social comparisons to others when it comes to health-related behaviors. Therefore, others who show superior health behaviors may also elicit negative feelings because of their threat to our self-image. It could have massive benefits on health outcomes, if we know what the influence of others is on positive or negative attitudes and health behavior. *One aim of the present research is to investigate whether people form negative attitudes towards others who portray superior health behaviors.*

Superior others may not only influence negative feelings or attitudes, but also behavior. Research on health experts who displayed fitness-promoting behaviors showed that this can be a turn-off for people who struggle with weight issues, causing them to avoid these health experts (Howe & Monin, 2017). Individuals perceive these health experts as a threat, because they fear they will be judged as inferior. Paradoxically, these experts do not offer an example to live up to, but instead could lead to a possible devaluation of the self. Even though others or health campaigns have the best interests at heart by setting an example, the usage of role models could backfire. People might respond in defensive ways, which in turn, can lead to the opposite of the desired behavior. In order to create interventions and campaigns that result in desired health outcomes, it is important to collect more knowledge on how attitudes towards others' superior health behaviors influence one's own health behavior, which is another aim of the present study.

Consequently, it is necessary to know what factors predict behavior. The theory of planned behavior (TPB) is a model that consists of the variables intentions, attitudes, subjective norms and perceived behavioral control (PBC) that all have an impact on behavior (Ajzen, 1991). The attitudes towards certain behaviors, the subjective norms, and the perceived behavioral control are all fairly accurate predictors of the intentions people have and in turn behavior can be predicted from intentions and the perceived behavioral control.

A review of the TPB applied to health-related behaviors showed that intention remains the most important predictor for behavior (Godin & Kok, 1996). The influence of PBC and attitudes on intentions was similar across health-related behavior categories. The subjective norm is less important when it comes to health-related behaviors (Godin & Kok, 1996), although some research does suggest that significant others with health promoting behaviors and attitudes have a positive influence on the health outcomes of young adults (Berge, MacLehose, Eisenberg, & Neumark-Sztainer, 2012).

Although intentions are an important predictor for behavior, there is also evidence of an intention-behavior gap (Webb & Sheeran, 2006). A medium to large change in intention leads to a small to medium change in behavior. For health behaviors this behavior gap seems to be a bit smaller; intentions have a medium to large effect size on behavior (McEachan, Conner, Taylor, & Lawton, 2011). A meta-analysis of physical activity behavior, however, showed a weak effect of intentions on behavior (Rhodes & Dickau, 2012). Hence, intentions are not perfect predictors of behavior and the influence of intentions seems to differ per type of health behavior. Indeed, many people struggle with turning healthy eating intentions into behavior (Kumanyika et al., 2000) and even though people might possess the knowledge to eat healthily, this is not related to Body Mass Index (O'Brien & Davies, 2007). A study on the influence of ideal images that were either muscular, athletic or thin showed that although looking at the athletic and muscular images resulted in inspiration, none of the conditions led to an increase of exercise (Robinson et al., 2017). The motivation to exercise may be strengthened by the inspiration these images ignite, but they do not influence exercise behavior. Thus, intentions and motivations to lose weight are difficult to turn into the desired behavior when a superior other portrays this behavior. This is especially true for individuals with a strong intention or motivation for health-related behaviors, because they are more likely to perceive the behavior of the other as a threat. This effect is similar to the greater dislike of superior others by people who value morality more greatly (Cramwinckel et al., 2013).

To counteract the negative impact of others' superior health behaviors on our self-concept, and therefore on our health behaviors, others can be devalued. The derogation of these targets can be achieved by adjusting the perception of the other based on different types of judgments. The judgments we make of others are usually quite broad and stereotypical, since a lot of cognitive resources are required to make nuanced and accurate judgments (Cuddy, Glick & Benninger, 2011). The Stereotype Content Model (SCM) focuses on these broad judgments and describes two dimensions of social perception; warmth and competence that underlie the perception of others (Cuddy, Fiske & Glick, 2008). The warmth domain relates to others' perceived intentions in the social context. The competence domain relates to the perceived abilities of others. People viewed as competitors are judged as lacking warmth, whereas people viewed as non-competitors are judged as warm. People viewed as high status are judged as competent, whereas people viewed as low status are judged as incompetent. Since people adjust the perception of others to maintain a positive self-image, they also adjust their perception of the competence and warmth of the other. People perceived as warm and competent elicit consistently positive emotions and behavior (Fiske, Cuddy & Glick, 2007). People that are perceived as lacking warmth and competence elicit negativity. Therefore a negative judgment of a superior other will be reflected in low scores on both dimensions.

When a target is perceived as incompetent, threatened participants do not derogate this target (Fein & Spencer, 1997). However, participants derogate a target that is perceived competent. If people could establish the competence of someone else based on information about the type of strategies they use and whether those strategies are efficient or scientifically-supported, it may influence the attitude towards others' superior behaviors. This could pose a potential buffer against the negative attitudes towards superior others. *The present study also investigates the effect of perceived scientific support for others' health behaviors on the attitudes towards others' health behaviors.* Different health strategies vary in their perceived scientific support, which can be used to manipulate others' perceived competence. Counting calories and exercising are effective and scientifically proven methods of losing weight (Kruger, Blanck & Gillespie, 2006; Anderson, Konz, Frederich & Wood, 2001). Although diet trends like the keto-diet may be increasing in popularity and could be slightly effective in weight loss, these methods are either not supported by enough research yet (Joshi, Ostfeld & McMacken, 2019) or have negative long-term consequences on health (Noto, Goto, Tsujimoto & Noda, 2013). Since most people have sufficient knowledge about good nutrition (O'Brien & Davies, 2007), it is likely that targets using scientifically proven

methods will be judged as competent, whereas targets followings trends without scientific backing would be judged as incompetent.

In summary, the current research has three main aims: it will investigate the existence of negative attitudes towards superior others' weight loss behaviors, whether assumed competence of the superior target moderates the attitudes formed, and how these attitudes may affect one's own health behavior. The first expectation is that participants will form negative attitudes towards targets who portray health behaviors, especially if these health behaviors are considered superior because participants themselves have a high motivation to lose weight. Second, targets portraying scientifically-sound health behaviors will evoke more negative attitudes, because targets who are perceived as competent are more likely to be derogated (Fein & Spencer, 1997). It is expected that perceived scientific support for the weight loss method moderates the effect of diet type on the attitudes towards the superior other. Since the method of counting calories and exercising is an effective and scientifically sound method of losing weight (Kruger et al., 2006; Anderson et al., 2001), it will elicit the most negative attitudes, because of the assumed competence of targets using this method. A negative attitude towards the other will be reflected by low scores on both the warmth and competence dimension, since people that are perceived as lacking warmth and competence elicit negativity (Fiske, et al., 2007). The negative attitude towards the target reduces the threat of the target, which takes away the need for defensive and counterproductive behavior. The negative attitudes towards others are therefore expected to mediate the relationship between others' superior health behavior and one's own behavior. The negative attitude towards the other will result in a lower preference for unhealthy behaviors.

Methods

Participants and design:

This study was assessed and approved by the Faculty Ethics Review Committee (20-0302). In this research a between subjects design was used with one independent variable consisting of the two different methods of losing weight (calorie counting and exercising versus the keto diet) and a behavioral measure (healthy or unhealthy food prize) as the dependent variable. The attitude towards the target is a mediator variable of the relationship between the type of method and the behavioral measure; and the scientific support is a moderator variable of the type of method on the attitude towards the other. Each participant only got to see one of the scenarios, since exposure to multiple scenarios would have increased the chance of participants behaving according to their perceived hypothesis of the research (Orne, 1962).

This research focused on the general population and a convenience sample was used. The participants were recruited through social media (LinkedIn & Facebook), a system for psychology students to collect participation points, and the social network of the researcher. Inclusion criteria were to be 18 years or older and to speak Dutch. An exclusion criterion was the presence of an eating disorder, since a questionnaire on weight loss might be a sensitive subject to people with eating disorders. The minimum number of participants was calculated with the program G* Power. Based on a small effect size of .20, an alpha of .05 and a desired power of .95 the sample was calculated to be 67. However, a minimum of 80 participants was set to be achieved to account for drop-outs, unexpected elimination of participants or outliers and to have an equal distribution of at least 40 participants over the two scenarios.

Data were collected from 120 participants (age range: 19-70; mean (SD) age = 30 (13.22); 95 women, 25 men). The average education level of the respondents was M = 6.25, SD = 1.18, but the modus was 7. The majority (61 percent) of the sample attended university.

Materials:

The experiment was conducted online through Qualtrics. All electronic devices could be used to fill in the questionnaire. As possible stimuli, three different weight loss and diet scenarios, with different levels of scientific backing (see appendix A), were created. Gender-neutral names were used to avoid potential effects of using distinctly male or female names. The scenarios were as follows (for the Dutch scenarios see appendix B):

Scenarios

Scenario 1:

Robin wants to get to a healthy weight and therefore has to lose some pounds. Counting calories and exercising therefore seems like a good method to Robin because it makes it easy to keep up with the amount of energy that is ingested and whether this corresponds to the amount that is burned per day.

Scenario 2:

Sam wants to get to a healthy weight and therefore has to lose some pounds. Sam therefore decides to eat more fruits and vegetables to replace as many unhealthy fats and sugars in other food resources as possible.

Scenario 3:

Alex wants to get to a healthy weight and therefore has to lose some pounds. Alex therefore decides to follow the ketogenic diet. This diet restricts Alex to eat almost no carbohydrates, but does allow for many fatty acids (70 percent of the diet). The strongly reduced intake of carbohydrates causes the body to revert to the usage of fatty acids as fuel for the body.

Pilot

A pilot study was executed to obtain independent participants' (n=10) ratings about the scenarios' dieting methods. All questions were answered on a scale of 1(not at all) to 10 (totally). The first question was about the effectiveness of the method; the second about the perceived degree of scientific soundness; the third about the participant's opinion on the methods. The last question focused on whether the participant would use the method themselves. There was also a possibility for the participants to give recommendations about the scenarios or questions through an open textbox at the end. The actual questionnaire can be found in appendix C.

The results of the pilot showed that the scenario about eating fruits and vegetables gained a similar average response to the scenario of counting calories and exercising (e.g., effectiveness ratings of 7.6 for fruits and vegetables, 7.5 for counting calories and exercising, and 5.3 for the keto diet). Since counting calories and exercising is proven to be a more effective and scientifically-sound method, the decision was made to exclude the fruit and vegetable scenario from the research in order to have non-redundant scenarios.

Questionnaire

A questionnaire based on the Stereotype Content Model (SCM) of Collange, Fiske and Sanitioso (2009) was translated into Dutch to test the attitudes towards the target. This model consists of a warmth and a competence scale, where warmth consists of the variables friendly, warm, good-natured and sincere and competence consists of competent, confident, capable and skillful (Cuddy, Fiske, Kwan, Glick, Demoulin, et al., 2009). All questions were answered on a scale of 1 to 5. The traits of each scale were averaged to get a score for each scale.

The researcher created the other questions. The first two questions focused on the perceived scientific support and effectiveness of the weight-loss method. Questions on participants' motivation to lose weight and eat healthily were included to account for participants' initial own desire for weight loss, which, in turn, would influence whether the target's behavior is considered valued and superior. These four questions were answered on a scale of 1 to 5. Questions on whether the participant knew this method (yes or no) and how

much knowledge they had about the method (scale 1 to 5) were included to check whether this would have an effect. Finally, demographic questions about age, gender and level of education were asked. The questionnaire can be found in appendix D.

Behavioral measure

A behavioral measure was created to measure the effect of the attitudes on participants' own actual behavior. At the end of the study, participants had to decide whether they wanted to win a healthy prize (a package of biological fruits, a juice and nuts) or an unhealthy prize (a package of candy and cookies). In order to win this prize, it was necessary to allocate 100 points as lottery entries for either prize. The division of these 100 points was completely up to the participant (e.g., 100 on one prize; 50-50 shared or any other division). The participants were made aware of the chances they would have to win either prize. The scores on either prize indicated whether the participant chose the healthy option and to what degree. Only the scores on the unhealthy prize measure were used for analysis, since the scores on both prizes were essentially the same but in opposite directions. A score of below 50 on the unhealthy measure was considered healthy because the highest preference was for healthy food, whereas a score of over 50 showed a preference for unhealthy food. The focus of this research was on behavior consisting of decision making rather than behavior measured with a questionnaire, since there is a known discrepancy between intentions and behavior (Webb & Sheeran, 2006) and questionnaires are also prone to social desirability (Van de Mortel, 2008). Since the behavioral decision results in a possible outcome (e.g., a prize), it could be a more realistic measure of behavior than intended or self-reported behavior.

Procedure:

All participants signed an informed consent by ticking a box before starting the experiment. The informed consent stated that participants could quit at any time and that anonymity would be guaranteed (see Appendix E & F). It also disclosed that the research was about opinions on weight loss methods, involved a questionnaire, and a prize could be won. Before being allowed to start, participants also had to indicate that they did not have any eating disorders. The average time it took to complete the questionnaire was 5 minutes.

Participants received one of the two scenarios at random, with one of the three names attached in a randomized order. After they confirmed to have read the scenario, they answered questions about their attitudes towards the target and their opinions on the dieting

strategy, as well as their own motivations and knowledge, and finally the demographic questions.

Finally, participants were asked for their preference of a prize, as a way of thanking them for their participation in the research. It was indicated that there would be one of each prize available. The participants divided their 100 points in order to have a higher chance to win one prize over the other. Participants were asked to write down their email addresses in order to win this prize. The email addresses were separated from the rest of the data prior to analysis to maintain anonymity.

Analyses:

First, the data were inspected. Two participants were only included in analyses which did not involve the behavioral measure because of missing values on this variable. A reliability analysis was performed for the questions on motivation to eat healthily and motivation to lose weight. These questions taken together proved to have a very weak correlation (.10) and a very low reliability (Cronbach's alpha = .18). Therefore, these questions were kept independent in further analysis. A reliability analysis for the questions on the effectiveness and scientific soundness of the weight loss methods showed adequate reliability (Cronbach's alpha = .79). The competence scale (Cronbach's alpha = .83) and the warmth scale (Cronbach's alpha = .85) showed good reliability. The complete SCM questionnaire with the two scales combined also showed a good reliability (Cronbach's alpha = .86). The correlation between these scales was moderate and significant, $r = .50, p < .001$. Therefore, the competence and warmth scales were combined to measure the attitudes towards superior others.

The program SPSS Statistics v26 was used to execute the statistical analyses. The assumptions for multiple regressions were checked before starting with the analyses. Not all the assumptions for the multiple regressions were met. There existed strong correlations between the interaction variable (weight loss method and scientific support) and the type of weight loss method and the scientific soundness of the method. This can be caused by the existence of dummy variables. The collinearity statistics (Tolerance and VIF) were not within limits (Field, 2013). The continuous variables in the model were centered to reduce multicollinearity. This resulted in collinearity statistics that were within limits. A couple of outliers were identified, but the Cook's distance scores indicated no influential outliers (Cook, 1977). A scatter plot and a histogram of the residuals showed that the assumption of homoscedasticity and normality were satisfied (Field, 2013). The normal p-plot for both

models showed a linear relationship between the independent variables and the dependent variable.

A moderated mediation multiple regression analysis was performed using PROCESS by Hayes. Finally, some explorative analyses were executed to check whether the different weight loss methods were actually perceived to differ in their effectiveness, scientific soundness and their effect on the attitude towards the target. As well as exploratory analyses to check the influence of motivation to lose weight on the attitudes and behavior. An analysis was performed to see if scientific soundness did tell something about the others' competence.

Results

Confirmatory analyses

First it was checked whether the perceived scientific soundness moderated the effect of type of method on attitudes towards the target. The attitudes were reflected by an average score of the combined warmth and competence scales. The motivation to lose weight was accounted for, to reflect the possible superiority of the target's behavior. A significant amount of the variance in the attitude towards the other was explained by the scientific soundness and the type of method and their interaction, $F(4, 113) = 8.79$, $p < .001$, $R^2 = .25$. The scientific soundness did significantly predict the attitude towards the other, $\beta = .31$, $t(113) = 5.08$, $p < .001$. The more scientifically sound the method was the more positive the attitude towards the other was. The type of method did not significantly predict the attitude towards the other (see Table 1 for all results) and therefore no significant moderation was found. The covariate of motivation to lose weight did not significantly predict the attitude towards the other.

Table 1. *Predictors of attitudes towards the other*

	β	t	p
(constant)	3.01	13.76	<.001
Type of diet	.05	.43	.67
Scientific support	.31	5.08	<.001
Interaction	-.20	- .17	.87
Motivation to lose weight	.04	.79	.43

Next it was examined if the attitude towards the other mediated the direct relationship between the type of diet method and the preference for unhealthy behavior, while also accounting for the motivation to lose weight. The model explained a significant amount of the variance in the preference for unhealthy behavior, $F(3, 114)= 11.37, p < .001, R^2 = .27.$ Neither the direct path of superior health behaviors on one's own health behavior or the indirect path through attitude towards the other was significant (see Table 2 for the results). Only the covariate of the motivation to lose weight significantly predicted a preference for unhealthy food, $\beta= - 18.55, t(114) = - 5.82, p < .001.$ The higher the motivation to lose weight, the lower the preference for unhealthy food options.

Table 2. *Predictors of the behavioral measure*

	β	t	p
(constant)	90.02	5.01	<.001
Type of diet	-2.20	-.39	.69
Attitude	5.40	1.18	.24
Motivation to lose weight	-18.55	-5.82	<.001

Explorative analyses

The keto-diet was rated lower in average scientific soundness and effectiveness (M = 2.78, SD= .97) than counting calories and exercise (M = 3.50, SD = 1.02). This mean difference was significant; $t(118)= - 3.94, p < .001.$ The attitude towards the target was less positive for the keto-diet (M= 3.10, SD = .71) than for the method of counting calories and exercising (M = 3.40, SD = .57), this mean difference was also significant: $t(118)= - 2.24, p = .027.$ The motivation to lose weight did not correlate with the attitudes formed towards the target, $r(119) = .02, p = .85,$ but it did correlate moderately to strongly with a preference for healthy behavior, $r(117) = - .51, p < .001.$ The scientific support correlated moderately to strongly with the competence, $r(119)= .63, p < .001.$

Discussion

The main goals of the current research were to investigate the existence of negative attitudes towards superior others' weight loss behaviors, whether the assumed competence of the superior target moderated the attitudes formed, and how these attitudes affected one's own preference for health behavior. The motivation to lose weight was accounted for. Participants judged one of the two targets on their warmth and competence, the scientific soundness of the target's method and indicated their preference between a healthy and an unhealthy prize.

The results did not confirm the first hypothesis that superior health behavior would result in a negative attitude towards the other. However, the scientific soundness of the method was a predictor of the attitudes towards others, but this was in the opposite of the expected direction. The more the weight loss method was perceived as scientifically sound, the more positive the attitude towards the other. The hypothesis that the scientific soundness would result in negative attitudes towards the other, because of the possibility to devalue the target when he/she was assumed competent, is therefore rejected. A moderating effect of scientific soundness on the attitudes towards the superior other was also not confirmed. The hypothesis that the attitude towards the other would lower the preference for unhealthy food was not confirmed and no mediation was therefore found.

There was no indication of a negative effect of people portraying superior health behaviors on one's own health behavior. This may indicate that people actually get inspiration from other people who show superior behavior, as is also confirmed by previous research (Lockwood & Kunda, 1997; Buunk et al., 2005). However, it could also signify that the target was not necessarily perceived as superior or as a threat. In this research a high motivation to lose weight was assumed to be an indicator of superior health behavior, since someone that values losing weight will be more threatened by someone that does show weight loss behaviors. However, a higher motivation to lose weight predicted a lower preference for unhealthy behavior. This suggests that the motivation to lose weight influences health behavior in a different way than was hypothesized. This research shows that the role of motivation is an important predictor of health behavior. Future research on how others' behaviors influence one's own health behavior could further investigate the role of motivation. An improvement for checking this hypothesis would be to also measure self-reported or actual weight loss behavior prior to the behavioral outcome. This would result in a score that measures whether the participant actually meets their health goal. When the participant does not meet this goal, while being motivated to achieve this goal, a superior other will be perceived as a threat.

The demonstration of health behaviors also did not have an effect on the attitudes towards the target. Yet, the explorative analyses showed that the attitudes towards the target using the keto-diet were less positive than the attitude towards the target using the method of calorie counting and exercising. The difference between these types of diets was significant, although not big. The attitude towards the other was measured through the warmth and competence scores. The average scores of both these scales were around the middle and neutral score. Since the scores on these scales were not low, this showed no proof of

negativity towards the target (Fiske et al., 2007). Again, this could be because of the aforementioned lack of perceived threat. The target might still not be threatening if the difference between the participant and the other is small (Lockwood & Kunda, 1997). A way to counteract this would be to look at one type of health behavior and vary this health behavior in its strength or use different types of diets or health behaviors that differ more from each other. This might result in an effect on the attitudes toward the target.

The scientific soundness of the methods did predict the attitude towards the other, but in the opposite of the expected direction. This goes against the theory that competent others will be derogated (Fein & Spencer, 1997). However, this research measured the assumed competence of the other through a measure of perceived scientific soundness of the method, alongside the attitudinal measure of the target's competence as measured through character traits. It seems likely that trait competence is related to the perceived scientific soundness and the explorative analyses also showed this relationship. Since the measurement of competence was also part of measurement of the attitude towards the target this could have been of influence. In that case the negativity towards the other would better be measured through a different construct. Future research should investigate the derogation of others through other measures of negativity towards the other. Derogation could for instance be investigated with a more direct measure like actual dislike.

Interestingly, the explorative analyses showed that the scientific support for the keto-diet was rated significantly lower than the scientific support for counting calories and exercising. This indicates that the participants did make a distinction between the methods, which were used. This also gives reason to believe that the targets will be judged less competent when they use the keto-diet, since it is judged as less scientifically sound. However, no moderation effect of scientific support was found. This can be explained by the fact that the type of method did not have an effect on the attitude towards the other, as well as the fact that the effect of scientific soundness might have been stronger on its own than in an interaction with the type of method.

No effect of attitude on the preference for unhealthy food was found. Since there was also no effect of the health behavior of the target on one's own behavior, this could also be explained by the scores on the behavioral measure. The average preference of either diet method lay around the score 30. Which indicates that there was a general preference towards the healthy food prize. This goes against the expected outcome and suggests that others' superior health behavior may not have an effect on one's own behavior, but the processes mentioned above (e.g. the other not being perceived as a threat) also give an explanation for

this outcome. Since the unhealthy package only consisted of candy, it could also indicate that some people do not like candy in general. To prevent this from influencing the outcome a measure of savory unhealthy foods could be included in future research. Another explanation for the preference of healthy food is that the participants in this research could already have an existing preference towards healthy food options. Although the motivation to eat healthily was evaluated in this research, this did not show whether this preference was already adhered to be the participant. A low score on motivation could mean participants were already eating healthily, but it is more likely that people who already eat healthily are motivated to keep doing so. To account for this, as stated before, a measure of already existing health behaviors prior to this behavioral outcome should be included.

Another limitation of the research could be that the participants did not compare themselves with the superior other. If they only read about the other without actually relating it to their own actions and values, it would mean that there was no actual social comparison. In that case, there would be no existence of a threat or derogation. Future research could make use of people acting out the behavior while being confronted to a superior other in order to create this social comparison, like has been done by Cramwinckel et al. (2013) for moral behavior. Another possibility would be to let people think about how the other would judge your behavior, like Minson and Monin (2012) did.

In summary, this research was not able to show the existence of negative attitudes towards superior others. It also did not show a moderation effect of scientific support on these attitudes or a mediation effect of negative attitudes towards others on health behavior. However, this does not mean that these relationships do not exist. Attitudes towards others could very well still have an effect on behavior. The limitations mentioned and the recommendations for future research should be taken into account to be able to tell whether this negative effect of superior others exists when it comes to health behavior. A replication with adjustments of the methods is advised before any statements on the social influence of these findings can be made.

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Appendix A:
Scientific backing of the scenarios

Three different scenarios were created to measure what effect the scientific soundness of different weight loss methods would have on attitudes towards others' health behaviors and subsequently the effect of these attitudes on one's own health behavior. The scientific backing for the three scenarios can be found below.

     Scenario 1:

In the first scenario counting calories and exercising is used as a method to lose weight. Assessment of reported weight loss strategies, found that exercising 30 minutes or more a day and adding physical activity to daily life were significantly more present among successful versus unsuccessful weight losers (Kruger, Blanck & Gillespie, 2006). Individuals who were successful at weight loss and maintenance were less likely to use over-the-counter diet products than those who were unsuccessful at weight loss. Diet products therefore do not seem to be a constructive aid in losing weight. Significantly more successful versus unsuccessful weight losers also reported that on most days of the week they planned meals (35.9% vs. 24.9%), tracked calories (17.7% vs. 8.8%), tracked fat (16.4% vs. 6.6%), and measured food on plate (15.9% vs. 6.7%). Moreover a meta-analysis of 29 studies showed that exercise is also an important factor in maintaining weight loss (Anderson, Konz, Frederich & Wood, 2001). Therefore scenario one was constructed as a scenario that is scientific sound. Measuring your calorie intake and exercising are constructive methods in losing weight.

     Scenario 2:

The second scenario is about eating more fruits and vegetables as a substitute for unhealthy sugars and fats in order to lose weight. Fruit and vegetables have a low energy density because of their high content of water, low content of energy, and high content of dietary fiber, which is considered to increase satiety and reduce feelings of hunger. Finally, they also contain flavonoids, a group of nonnutritive phytochemicals that may have anti obesity effects (Buijsse, Feskens, Schulze, Forouhi, Wareham, Sharp, Palli, Tognon, Halkjaer, Tjonneland, Overvad, Van der A, Du, Sorenson, Boeing, & Jakobsen, 2009). However a higher intake of fruits and vegetables is not automatically associated with weight loss, since a higher intake of calories will not lead to weight loss but weight gain. Substituting certain types of foods with fruits and vegetables however could be a way to achieve weight loss. A study that looked at different dietary changes indicated that increases in fruits, vegetables, and low-fat dairy, as

part of a calorie controlled diet, helps to both achieve and maintain weight loss (Champagne, Broyles, Moran, Cash, Levy, Lin, Batch, Lien, Funk, Dalcin, Loria & Myers, 2011). Adding fruits and vegetables to your diet will therefore not simply lead to weight loss. However it is proven to be a contributor to a healthier lifestyle. This scenario is therefore also scientifically sound, but will have a smaller effect on weight loss.

Scenario 3:

Lastly scenario three is about the keto or ketogenic diet. This is a diet that has been growing in popularity. The followers of this diet forgo nearly all carbohydrates, avoid excess protein, and consume high levels of fat (generally exceeding 70% of calories consumed), resulting in the production of ketones, giving the diet its name (O'neill & Raggi, 2020).

A meta-analysis of 13 studies showed that the low carbohydrate ketogenic diet was more effective in losing weight than a low fat diet (Bueno, de Melo, de Oliveira, da Rocha Ataide, 2013). The ketogenic diet was associated with less than a kilo extra weight loss over a low fat diet, this was a statistically significant difference. However all diets are based on the premise of reducing calorie intake, in which the keto diet is no exception (Joshi, Ostfeld & McMacken, 2019). The question is whether a diet is also a safe long term method in losing weight, in the sense that it causes no unexpected additional harm. The keto diet has not been researched enough to prove such risks do not exist. Some indications for long term health risks do exist however. A systematic review and meta-analysis consisting of 17 studies has shown that low-carbohydrate diets are associated with a significantly higher risk of all-cause mortality (Noto, Goto, Tsujimoto & Noda, 2013). In fact, low-carbohydrate diets tend to result in reduced intake of fiber and fruits, and increased intake of protein from animal sources, cholesterol and saturated fat, all of which are risk factors for mortality and CVD. The keto diet therefore seems to be a decent effective method in losing weight. However multiple studies have shown that there might be negative consequences to the keto diet. It is therefore not a scientifically sound method to lose weight.

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Appendix B:

Scenarios in Dutch

Scenario 1:

Robin wil op gezond gewicht komen en moet daarvoor wat kilo's gaan afvallen. Het tellen van calorieën en meer bewegen lijkt Robin daarom een goede methode omdat hij/zij zo precies kan zien hoeveel energie hij/zij binnenkomt en of dit overeenkomt met hoeveel hij/zij per dag verbrandt.

Scenario 2:

Sam wil op gezond gewicht komen en moet daarvoor wat kilo's gaan afvallen. Sam besluit daarom om meer groentes en fruit te gaan eten om zo ongezonde suikers en vetten uit andere voedingsstoffen zoveel mogelijk te vervangen.

Scenario 3:

Alex wil op gezond gewicht komen en moet daarvoor wat kilo's gaan afvallen. Hij/zij besluit daarom om het keto dieet te gaan volgen. Bij dit dieet mag Alex bijna geen koolhydraten eten, maar wel veel vetten (70 procent van het dieet). Door de sterk verminderde inname van koolhydraten, gaat het lichaam over op het gebruik van vetten als brandstof.

Appendix C:

Pilot

The pilot questionnaire included the following questions for each scenario:

1. Hoe effectief denk jij dat de methode '' '' is om af te vallen?

    Zeker niet effectief of zeker wel effectief (op een schaal van 1 tot 10)

2. In hoeverre denk jij dat deze methode wetenschappelijk bewezen is?

    Helemaal niet wetenschappelijk bewezen tot helemaal wel wetenschappelijk

    bewezen (op een schaal van 1 tot 10)

3. Wat is jouw mening over de volgende methodes; " "?

    Zeer negatief tot zeer positief (op een schaal van 1 tot 10)

4. In hoeverre zou je de volgende methodes zelf gebruiken?

    Helemaal niet tot helemaal wel (op een schaal van 1 tot 10)

5. Als je nog op- of aanmerkingen hebt over de scenario's, kun je die hier invullen:

    (open textbox)

Appendix D:

Questionnaire

The questionnaire consists of the following questions, all answered on a 1-5 Likert scale:

Warmth and competence vragen (helemaal niet (1) tot helemaal wel (5))

1. Hoe competent vind jij Robin/Alex/Sam overkomen?

2. Hoe zeker vind jij Robin/Alex/Sam overkomen?

3. Hoe bekwaam vind jij Robin/Alex/Sam overkomen?

4. Hoe vaardig vind jij Robin/Alex/Sam overkomen?

5. Hoe vriendelijk vind jij Robin/Alex/Sam overkomen?

6. Hoe warm vind jij Robin/Alex/Sam overkomen?

7. Hoe goedaardig vind jij Robin/Alex/Sam overkomen?

8. Hoe oprecht vind jij Robin/Alex/Sam overkomen?

Other questions

9. In hoeverre ben jij gemotiveerd om gewicht te verliezen?

   Helemaal niet tot helemaal wel

10. In hoeverre ben jij gemotiveerd om gezond te eten?

   Helemaal niet gemotiveerd tot heel erg gemotiveerd

11.Wat is jouw mening over het gedrag van Robin/Alex/Sam?

   Zeer negatief tot zeer positief

12. In hoeverre denk je dat de afvalmethode van Robin/Alex/Sam effectief is om gewicht te verliezen?

   Zeer onwaarschijnlijk tot zeer waarschijnlijk

13. In hoeverre denk jij dat de afvalmethode van Robin/Alex/Sam wetenschappelijk bewezen is?

   Helemaal niet wetenschappelijk bewezen tot helemaal wel wetenschappelijk bewezen

14. Hoeveel kennis heb jij over deze methode om gewicht te verliezen?

   Zeer weinig tot zeer veel

15. Heb je ooit gehoord van deze methode om gewicht te verliezen?

Demographic questions

16. Wat is je leeftijd?

17. Wat is je geslacht?

18. Wat is je hoogst genoten opleiding?

Appendix E:

Information letter

20-10-2020

Titel: **Onderzoek naar opinies over andermans gezondheidsgedrag en de invloed op het eigen gezondheidsgedrag**

Geachte participant,

U gaat meedoen aan een onderzoek over een afvalmethode. Er zal u een scenario voorgelegd worden, waarna u een aantal vragen moet beantwoorden over deze afvalmethode en de persoon in het scenario. Het gaat bij de vragenlijst om uw mening en er zijn dan ook geen goede of foute antwoorden. U mag op elk moment besluiten te stoppen met het onderzoek. De tot dan toe verzamelde data zullen wel opgeslagen worden en kunnen mogelijk gebruikt worden. De totale duur van het invullen van deze vragenlijst zal ongeveer 10 minuten zijn. Door mee te doen aan dit onderzoek helpt u de wetenschap en maakt uw kans op 1 van de 2 prijspakketten. Voor psychologie studenten zijn er .25 PPU te verdienen. Het doel van het onderzoek is om te meten welke attitudes er bestaan richting deze afvalmethode en hoe dit verband houdt met het eigen gezondheidsgedrag.

Dit onderzoek is onderdeel van de masterscriptie en zal dan ook alleen binnen de Universiteit Utrecht gepubliceerd worden. Er zal voorzichtig met uw gegevens worden omgegaan. Alleen de onderzoeker heeft toegang tot de gegevens en uw data zullen worden geanonimiseerd. Voor het ontvangen van een prijspakket is het noodzakelijk uw e-mailadres achter te laten. Uw persoonlijke data zullen apart worden bewaard van de onderzoeksdata. De geanonimiseerde data zullen 10 jaar op de server van de Universiteit Utrecht bewaard worden. Het is mogelijk dat deze data voor verder onderzoek gebruikt worden, maar hierbij zal altijd alleen gebruik gemaakt worden van anonieme data.

Alvast bedankt voor het meedoen!

Voor vragen of opmerkingen over het onderzoek kunt u terecht bij de onderzoeker:
Eva Sturkenboom
e.i.sturkenboom@students.uu.nl

Voor vragen of opmerkingen over het onderzoek kunt ook terecht bij:

Leslie van der Leer

L.vanderleer@uu.nl

Voor klachten over het onderzoek kunt u terecht bij:

klachtenfunctionaris-fetcsocwet@uu.nl

Contactinformatie van de functionaris gegevensbescherming:

privacy@uu.nl

Appendix F:

Informed consent

Onderzoek naar opinies over andermans gezondheidsgedrag en de invloed op het eigen gezondheidsgedrag

Door de optie akkoord aan te klikken geef ik aan dat ik ben geïnformeerd over het doel van het onderzoek en de manier waarop er met mijn data worden omgegaan. Ik geef daarmee ook aan dat ik op de hoogte ben dat ik op elk moment kan stoppen met het onderzoek zonder reden en zonder consequenties.