

# Reception of health messages: effects of stigmatization and forcefulness

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## ABSTRACT

**Background** Diet-related health messages often use scare tactics and negative imagery. However, they show limited effectiveness. Improving these messages is important to prevent further increases of obesity rates and consequential sicknesses. When designing a health message, image choice and wording are central. Controversy revolves around the use of stigmatizing images. Body weight influences the effect of stigma on the participants, and detrimental effects are observable in individuals with overweight. Wording has to be concrete but not too forceful.

**Methods** In this study, female subjects ( $N = 162$ ) saw a stigmatizing versus non-stigmatizing health message with forceful versus non-forceful wording ( $2 \times 2$ -design). Effects on a virtual food choice task (healthy versus unhealthy), diet intentions and concerns to be stigmatized were assessed.

**Results** In the non-stigmatizing and non-forceful condition, participants made the highest number of healthy food choices. In the two stigma conditions, higher body mass index correlated with higher concern to be stigmatized, highlighting the adverse effect a health message can have.

**Conclusions** In a female student sample, a non-stigmatizing and non-forceful text had the most positive effect on healthy food choices without evoking concerns to be stigmatized. This should be considered when promoting a healthy lifestyle.

**Keywords** obesity, population-based and preventative services, public health

## Introduction

Since 1975, worldwide overweight and obesity rates nearly tripled to almost 40%.<sup>1</sup> This puts a strain on health care and work productivity: In USA, the total cost of obesity was estimated to be more than 1.4 trillion dollars.<sup>2</sup> The use of health care and care-giving expenses and the inability to work due to health problems negatively affect the entire community. Therefore, raising public awareness on the importance of a healthy lifestyle has high priority. Research has looked into the determinants of successfully influencing health behavior. Approaches include altering food, developing new health interventions and trying to influence behavior.<sup>3</sup> Different theories focus on the individual beliefs about a behavior or illness,<sup>4</sup> with the health appeal itself evoking fear to some degree but also providing reasonable behavioral advice,<sup>5</sup> and the formation of behavioral intentions based on subjective impressions of normative behavior and control beliefs.<sup>6</sup> While these models regard different aspects as central to

behavioral change, they all share the conviction that awareness of the health behavior problem, an optimistic attitude toward achieving the behavior change and individual motivation to change behavioral patterns are the important components of health behavior change.

Perhaps the most economic low-level public health intervention is the use of informational health messages, e.g. focusing on reasons to start eating healthier. Messages can be displayed on billboards, posters and in media advertising, which has been shown to positively influence health behavior.<sup>7</sup> However, the general effectiveness of such informational health messages is rather low.<sup>8</sup> Following behavior change theories, different factors that influence how positive a message is received and how likely a subsequent behavioral change is have been investigated.<sup>9,10</sup> On the one hand, a message

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has to attract attention and be explicit about the addressed behavior, but on the other hand, it has to be sensible about the attitude and readiness of the target audience.<sup>11</sup> When designing a health message, two core components need to be considered: image material and wording. The aim of the present study was to investigate how these components in interaction are received. Regarding image material, we looked into the use of potentially stigmatizing content. With regard to wording, we investigated the degree of forcefulness used to convey the health messages.

## Stigma

Health messages often display the consequences of an unhealthy diet in a negative and graphical way. In online news, most images used for individuals with overweight were rated negative and stigmatizing, for example, by showing them eating, less professionally clothed than individuals with normal weight or with a focus on their abdomen.<sup>12</sup> This can give rise to prejudices and feelings of stigma even in obesity-related health campaigns that seek to improve the recipient's diet. Further, stigmatizing content induced less self-efficacy and no higher motivation to comply<sup>13</sup> and has been found to have a negative impact on the mood and quality of life.<sup>14</sup> Crucially, not all recipients react to stigmatizing content in the same way. Reading about the negative consequences of being overweight resulted in a higher calorie intake in women with overweight but not in women in a normal weight range.<sup>15</sup> Graphical depictions of weight stigma compared to images of fast food even resulted in stronger behavioral intentions to eat healthier in participants with normal weight, whereas no effect was found in participants with overweight.<sup>16</sup> Thus, stigmatizing material might act as a warning sign to individuals with normal weight, but it seems to be especially detrimental to the eating behaviors of exactly those people it aims to motivate to eat more healthily. This is why the present study considers body mass index (BMI) as a key moderator.

## Forcefulness

The theory of psychological reactance suggests resistance processes, i.e. doing the opposite of what the rule suggests to restore threatened personal freedom.<sup>17</sup> Consequently, careful consideration has to be put in the wording of a health message. Suggesting rather than commanding a health behavior seems to be more successful<sup>18</sup> and an empathic, non-forceful wording can increase perceived self-efficacy.<sup>19</sup> By using words like 'might' and 'should' rather than 'must' or 'have to', the recipient is given the choice of how to react to the message. This prevents provoking anger, disagreement and the intention to not comply with the message or even display

oppositional behavior.<sup>20,21</sup> Little research has been conducted on factors that influence the magnitude of a reactance reaction. Messages that require less drastic behavior changes led to less reactance, while better argument quality and the severity of portrayed consequences (e.g. averting a potentially life-threatening disease) did not improve the willingness to comply.<sup>22</sup> Perceived trustworthiness of the source of the message, on the other hand, was shown to increase both attention to the message and behavioral change intentions.<sup>11</sup> Additionally, 'inoculation' has been found to reduce the reactance, i.e. preparing the recipient for the upcoming persuasive attempt that might potentially be a threat to their freedom.<sup>23</sup>

## Present research

While a substantial body of research has investigated the effects of both stigmatizing image material and forceful wording in health messages on people's reception of these messages and message effectiveness, research investigating both aspects conjointly is lacking. As most informational health messages do contain both image material and wording, it is important to determine how these aspects interact. This study therefore investigated the effect of a stigmatizing compared to a non-stigmatizing image in combination with forceful versus non-forceful wording. Outcome measures included healthy food choices in a virtual food choice task and diet intentions. This assessed proneness to eat healthier with both self-report and an implicit behavioral measure, and thereby, whether the aim of the health message was achieved. Further, feelings of stigma in response to the health message were assessed.

We propose that forceful wording may exacerbate the effects of stigmatizing imagery. This effect could be observed in either direction. On the one hand, stigmatizing imagery may reduce people's self-efficacy for healthy eating, their mood and their actual healthy eating behavior, especially in women with higher BMI.<sup>13–15</sup> Forceful wording may add on to the detrimental effects of stigmatizing imagery. For women with normal BMI, on the other hand, stigmatizing imagery has been shown to exert a 'warning sign' effect,<sup>16</sup> which might be reinforced by forceful wording. For these women, the combination of a stigmatizing image and forceful wording may also help make the message more concrete, which may facilitate effectiveness.<sup>11</sup>

Since we did not selectively include women with overweight or obesity, we hypothesize that first, for women with a normal BMI, the stigmatizing and forceful message might be just as effective as the non-stigmatizing and non-forceful message regarding healthy food choices, dieting intentions and stigma concerns. Second, we look into the effect of BMI

and hypothesize that for women with higher BMI, being in one of the stigmatizing conditions will result in lower healthy food choices, lower dieting intentions and higher stigma concerns.<sup>16</sup>

## Materials and methods

### Participants

Students, PhD students and graduates were recruited via a university web page, flyers, e-mails and social networks. Participants were required to be female, fluent in English and between the ages of 18 and 40. An all-female student sample was chosen because susceptibility to weight stigma is the highest in young women compared to older or male individuals.<sup>24</sup> In this group, discrimination due to being overweight is perceived to be comparable to racial discrimination.<sup>25</sup> Further, women have a stronger tendency to use eating as a coping mechanism for stress and negative emotions.<sup>26</sup> We aimed for a sample size of 160 participants (40 participants per condition) based on a power ( $1-\beta$ ) of 0.80, an effect size of  $d = 0.6$  in a one-tailed test and  $\alpha = 0.05$ . Further, we included additional 10% of the participants per condition, taking possible dropouts and incomplete data into account. The final sample included  $N = 162$  individuals with an average age of 22.8 years (standard deviation [SD] = 3.49). They had a mean BMI of 21.8 (SD = 3.13, range: 16.4–35.9). To get a representative cross-section of a female student population, we also included women with overweight or obesity ( $n = 16$ ). Most participants were Dutch (40.7%), German (22.2%) or Spanish (9.2%). Forty-five percent studied psychology, most of them on a bachelor's level.

### Procedure

Using Qualtrics,<sup>27</sup> an online questionnaire was designed. All but two participants completed the survey online, as the shortness of the study (7–10 min) lead to higher resonance by conducting it online. Fifty participants received study credits as a compensation; the rest participated out of interest. After providing informed consent, participants answered demographic questions and baseline questions on diet, weight satisfaction and hunger. Afterward, they were randomized to be presented with one of the four different health messages and they rated them on several dimensions. Then, they completed a virtual food choice task. Lastly, the participants answered outcome questionnaires regarding feelings of stigmatization due to body weight and intentions to start eating healthier. See Supplement A for detailed information on questionnaires and the food choice task used in this study. The Ethics Committee of Vrije Universiteit, Amsterdam approved of the study.

### Health message

Images of the health message portrayed either a man with overweight eating a burger in the stigma condition that focused on individual responsibility, or a street with various fast-food chain restaurants as a typical obesogenic environment in the non-stigma condition.<sup>28</sup> Wording of the text was based on a study by Dillard and Shen.<sup>20</sup> In a red, bold font, texts were put in the foreground of the image (The forceful text read 'Do it because you have to! Unhealthy eating causes obesity, chronic diseases, lack of energy, and low confidence. Healthier eating has many benefits! You have to take care of your body. Start the change today!') The non-forceful text read 'Why not give it a try? Unhealthy eating causes obesity, chronic diseases, lack of energy, and low confidence. Healthier eating has many benefits! Now might be a good time to start—Your body will thank you!'). Four health-promoting messages were created by combining images and texts: stigmatizing/non-forceful, stigmatizing/forceful, non-stigmatizing/non-forceful and non-stigmatizing/forceful ( $2 \times 2$ -design). Participants were instructed to look at the health messages carefully and 'let the message sink in', with a remark that they would 'have to answer some questions about the message afterward'. To ensure that participants spent enough time to examine the health message, they could only go to the next part of the study after a minute. See Supplement B for the health messages and their validation in a pilot study.

### Statistical analysis

For baseline questionnaires and the manipulation check, means of the four conditions were compared in a  $2 \times 2$  (stigma  $\times$  forcefulness) Analysis of variance (ANOVA). For the main analyses, bivariate correlations were computed for all possible covariates with all dependent variables. Variables that correlated significantly with outcome measures were included as covariates for these particular Analysis of covariance (ANCOVA), and they were excluded from the model if not a significant predictor. This did not change significances. For our second hypothesis regarding BMI, a simple slopes analysis was conducted by dummy coding the factor stigma, following the guidelines of Aiken and West.<sup>30</sup> BMI was standardized and an interaction between stigma and BMI was computed. Slopes for high (+1 SD) and low (−1 SD) BMI were calculated. A multiple regression analysis was conducted.

## Results

### Baseline questionnaires

Participants indicated that a healthy diet was important to them ( $M = 5.23$ ,  $SD = 1.54$ ), perceived their own diet as

**Table 1** Means (SDs) for each condition regarding healthy food choices, dieting intentions and stigma concerns, separate for low and high BMI

Variable	Non-stigmatizing, non-forceful		Stigmatizing, non-forceful		Non-stigmatizing, forceful		Stigmatizing, forceful	
	Low BMI	High BMI	Low BMI	High BMI	Low BMI	High BMI	Low BMI	High BMI
Healthy food choices	3.62 (1.43)	2.50 (1.50)	2.29 (1.44)	2.39 (1.34)	2.56 (1.16)	2.56 (1.26)	3.16 (1.57)	2.57 (1.43)
Dieting intentions	3.76 (0.64)	3.68 (0.87)	3.31 (1.03)	3.68 (0.98)	3.64 (0.83)	4.02 (0.77)	3.33 (1.05)	4.00 (0.80)
Stigma concerns	1.73 (1.36)	2.80 (1.95)	2.57 (1.39)	2.99 (1.80)	2.45 (1.54)	2.77 (2.13)	2.16 (1.58)	3.29 (1.98)

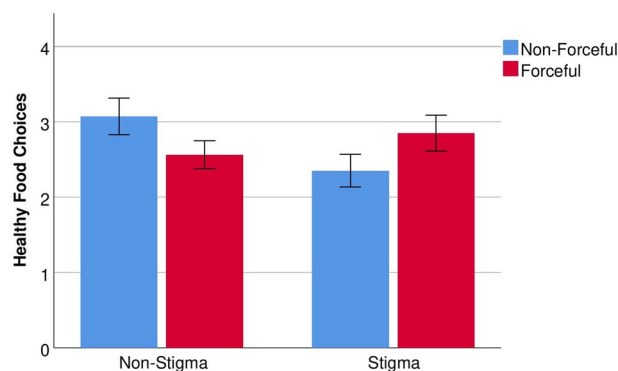
quite healthy ( $M = 4.56$ ,  $SD = 1.21$ ), were not very hungry when starting the study ( $M = 2.91$ ,  $SD = 1.77$ ) and were in a good mood ( $M = 5.11$ ,  $SD = 1.48$ ). They further had a higher autonomous ( $M = 5.36$ ,  $SD = 1.09$ ) than controlled ( $M = 3.09$ ,  $SD = 1.26$ ) motivation to eat healthy and felt neutral about their weight ( $M = 4.16$ ,  $SD = 1.86$ ). Group means did neither differ in any of these measures, nor in age or BMI, all  $P$ s  $> 0.158$ .

### Experimental manipulation

Participants paid attention to the message ( $M = 4.95$ ,  $SD = 1.64$ ) and found it easy to understand ( $M = 6.00$ ,  $SD = 1.03$ ). Yet, they did not find the message very interesting ( $M = 3.70$ ,  $SD = 1.69$ ), personally affecting ( $M = 2.83$ ,  $SD = 1.66$ ), evoking positive emotions ( $M = 2.95$ ,  $SD = 1.52$ ) or caring about the participant as a person ( $M = 3.40$ ,  $SD = 1.718$ ). These descriptive measures did not differ between conditions (all  $P$ s  $> 0.132$ ). In the two stigma conditions, participants perceived the message as more stigmatizing ( $M = 4.75$ ,  $SD = 1.37$ ) than participants in the non-stigma condition,  $M = 4.17$ ,  $SD = 1.61$ ;  $F(1, 158) = 6.06$ ,  $P = 0.015$ ,  $\eta^2 = 0.037$ . In the two forceful conditions, participants perceived the message as more forceful ( $M = 4.21$ ,  $SD = 1.53$ ) than participants in the non-forceful conditions,  $M = 3.7$ ,  $SD = 1.12$ ;  $F(1, 158) = 5.70$ ,  $P = 0.018$ ,  $\eta^2 = 0.035$ . On trend level, participants in the forceful conditions ( $M = 5.28$ ,  $SD = 1.60$ ) agreed less with the health message than the participants in the non-forceful conditions,  $M = 5.70$ ,  $SD = 1.08$ ;  $F(1, 158) = 3.80$ ,  $P = 0.053$ ,  $\eta^2 = 0.024$ .

### Outcome measures

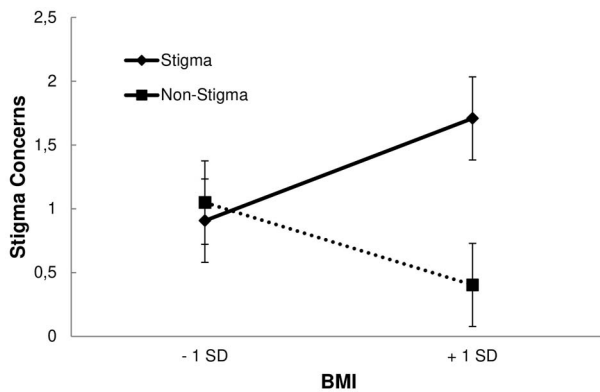
See Table 1 for means and SDs for each condition for each outcome variable, separate for low and high BMIs.

**Fig. 1** Mean healthy choices in the food choice task in the four conditions. Error bars represent 95% confidence intervals.

### Food choices

In the virtual food choice task, participants made, on average, 2.71 healthy choices out of 6 ( $SD = 1.43$ ). While no significant main effects were found, an interaction pointed toward different patterns in the four conditions,  $F(1, 156) = 5.281$ ,  $P = 0.023$ ,  $\eta^2 = 0.033$  (Fig. 1), controlling for the covariates importance of a healthy diet ( $F(1, 156) = 6.71$ ,  $P = 0.010$ ,  $\eta^2 = 0.041$ ) and current hunger ( $F(1, 156) = 5.76$ ,  $P = 0.018$ ,  $\eta^2 = 0.036$ ). *Post hoc* pairwise comparisons indicated that participants in the non-forceful and stigmatizing condition made the least and significantly fewer healthy choices ( $P = 0.011$ ) than participants in the non-forceful condition who were presented with non-stigmatizing images. None of the other pairwise comparisons reached statistical significance (all  $P$ s  $> 0.093$ ). Results thus indicate that the presence of stigma moderates whether non-forceful wording has a positive impact on food choices. These effects were independent of BMI, all  $P$ s  $> 0.183$ .





**Fig. 2** Simple slopes showing the negative impact of stigmatizing content when having a higher BMI (after 36). Error bars represent 95% confidence intervals.

### Diet intentions

No significant differences between experimental conditions and BMI were found for the intention to eat healthier, all  $P$ s > 0.079.

### Weight stigma concerns

Participants reported rather low stigma concerns ( $M = 2.59$ ,  $SD = 1.75$ ). There was no main effect of forcefulness and stigma and no interaction, all  $F$ s(1, 155) < 1.85,  $P$  > 0.176,  $\eta^2 < 0.012$ . Only participants with a high BMI reported more stigma concerns in the stigma condition (simple slope,  $t(161) = 2.05$ ,  $P = 0.042$ ), not participants with a low BMI (simple slope,  $t(161) = -0.083$ ,  $P = 0.934$ ), including weight satisfaction, autonomous and controlled motivation as covariates (Fig. 2). This supports our second hypothesis that stigma has a more negative impact on individuals with higher BMI.

## Discussion

### Main finding of this study

This study investigated the impact of stigmatizing images and forceful wording on healthy food choices, dieting intentions and concerns to be stigmatized. In line with our first hypothesis, healthy food choices were nominally most frequent in the non-forceful/non-stigma condition. Yet, this did not differ from the forceful/stigmatizing group, and stigma only had a negative impact in the non-forceful/stigmatizing condition. No differing effects were found for dieting intentions. In line with our second hypothesis on stigma concerns,<sup>15</sup> participants with a higher BMI were more negatively affected by stigmatizing images and reported higher concerns to be treated unequally due to their weight. Although our sample was in the normal weight range, 56.2% of the participants above

the median weight stated that they were unhappy with their weight (compared to 25.6% of participants below the median,  $P < 0.001$ ). BMI did not interact with the different conditions regarding healthy food choices or dieting intentions.

### What is already known on this topic

In line with Young *et al.* (2016), the stigmatizing and forceful content might have induced a stronger warning sign reaction to not neglect one's diet. Further, it is possible that seeing an individual rather than fast-food chains made the content more concrete.<sup>11</sup> Thus, a non-forceful wording might be beneficial,<sup>18</sup> but in combination with stigma forcefulness, it might help to stress the importance of the communicated behavior. Findings of this study confirm a negative effect of stigmatizing images,<sup>13</sup> even for participants with normal weight, contrary to the findings of Young *et al.* (2016).

### What this study adds

To our knowledge, this is the first study that investigates the additive and interactive effects of stigma and forcefulness in health messages while considering BMI as a moderator. Participants in our sample felt capable to resist eating in certain situations, and their motivation to eat healthy was autonomous rather than controlled. However, some left comments expressing weight concerns after finishing the study, which shows that dietary concerns are a present topic in female students even if they perceive their diet and weight as mostly healthy. The promotion of healthier eating habits has a high relevance beyond preventing obesity: recent European Union-wide projects stress the importance of a healthy diet and weight for preventing mood disorders.<sup>29</sup> Further, these insights are valuable for lifestyle interventions beyond diet and weight loss that might be relevant in this population, e.g. regarding smoking or screen time on mobile phones.

One might argue that a health message alone does not have a big impact on the actual behavior and that more direct interventions are needed for that. However, studies show that short advertisements can both increase unhealthy eating behavior<sup>30</sup> as well as decrease it,<sup>31</sup> which highlights the potential impact of a simple health message. In the light of increasing health and well-being concerns due to stigmatizing obesity,<sup>32</sup> future campaigns should be especially considerate in this regard when designing health messages. The acceptance and success of environmental strategies like subconscious priming of health goals, putting healthy choices in the foreground and labeling of food<sup>33</sup> might be increased by providing informational material. As shown in this study, a health message that supports the recipient's autonomy without being judgmental might provide this information.

## Limitations of this study

A food choice task seems to be a promising measure for future studies, as virtual choice is related to actual choice<sup>34</sup> and thus has high external validity. Yet, the task is still hypothetical and could be combined with real consumption (e.g. by randomly selecting a food that was chosen in the task and present it to the participant to measure consumed calories). Further, although pre-validated material was used, several participants pointed out that some of the healthy choices did not seem healthy to them or that they did not like specific food items, which could be prevented by individualizing food stimuli. Additionally, long-term eating habits might not be adequately represented by a one-time decision task. Naturalistic ecological momentary assessment might help to assess the eating habits and the endurance of health message effects on diet and weight longitudinally.<sup>35</sup> Likewise, the use of a longer and more intense experimental manipulation might strengthen the effects that this study found. Showing more than one picture and message per condition might further rule out possible confounding effects, e.g. generally feeling more affected by a picture showing a person compared to an urban environment. Lastly, we did not compare equally sized samples of women with healthy weight as well as women with overweight or obesity, which could further increase the knowledge of stigma concerns and health message effects on the eating behavior.

Concluding, we show that informational messages can have an impact in a student population, a period in life which is the transition to adulthood, with many students moving out of home and starting to be responsible for their diet themselves. In combination with making healthier food choices more attractive and available, we can work toward forming healthy eating habits early in life.

## Supplementary Data

Supplementary data are available at the *Journal of Public Health* online.

## Funding

This study was conducted without a funding body.

## Data Availability

Raw study data can be made available upon request.

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