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Decreasing meat consumption using social norms:

Can dynamic norms increase a negative attitude towards meat consumption?

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Abstract

Meat consumption has a negative impact on the environment, animal suffering and human health, however meat consumption is still rising. This study examines the question if social norms can be used to reduce meat consumption, and if this effect is dependable on the current amount of meat consumed. Has normative information about an ongoing change in others (dynamic norms) more impact on attitude than normative behaviour about a current state (static norms)? The effect of these social norms on attitude towards meat consumption, with meat consumption as a moderator, was analysed using a general linear model. Our findings did not support the hypotheses. No significant effects were found, and we recommend future research to strengthen the manipulation in which the social norms were exposed and examine the possibility of attitude change over a period of time.

Keywords: social norms, dynamic norms, static norms, meat consumption, attitude change

Introduction

Meat consumption is rising: the global average of meat per capita as well as the total amount of meat consumed, is increasing due to higher incomes and population growth (Godfray et al., 2018). This is concerning because of several reasons. First, the meat industry has a major impact on the environment and health of the planet (OECD, 2021). Meat consumption is responsible for 56 percent of the total agricultural emissions and 93 percent of all livestock emissions globally (Willits-Smith, Aranda, Heller, & Rose, 2020). It is also responsible for 20 to 30 percent of global greenhouse gas emissions, and a significant amount of deforestation and biodiversity loss worldwide (IPBES, 2019). Agriculture, in particular animal farming, is the highest source of air pollution damages in the United States (Tschofen, Azevedo, & Muller, 2019). On a local level, it also has impact on the pollution of water, soil, and air (Poore & Nemecek, 2018). In addition, the land, energy, and water used to grow animal feed could be used more efficiently to grow plant-based food for (direct) human consumption (Shepon, Eshel, Noord, & Milo, 2018). Meat consumption also has an indirect impact on antibiotics resistance and zoonoses: diseases transmitted from animals to humans (Bonnet, Bouamra-Mechemache, Réquillart, & Treich, 2020). Another concerning reason is animal suffering in the farming industry. The way in which, and the size of the scale in which, animals are being raised and slaughtered raises concern (Ruby, 2012). Finally, the consumption of meat is also associated with health concerns. It increases the risk of chronic health diseases (Godfray et al., 2018) and red and processed meat is positively associated with all-cause mortality, especially cancers (Rohrmann et al., 2013). Red meat is associated with colorectal, pancreatic, and prostate cancer. A daily intake of a 50-gram portion of processed meat increases the risk of colorectal cancer by 18 percent (IARC, 2015). Processed meat consumption is also related to coronary heart disease (Micha, Wallace & Mozaffarian, 2010) and diabetes (Wolk, 2017) because of the high content of cholesterol and saturated

fatty acids. In addition, all meat intake is associated with weight gain (Vergnaud, Norat, Romaguera, & Peeters, 2010) and increases the risk of developing an antibiotic-resistant bacteria due to the use of antibiotics in animal feed on a large scale (Bonnet, Bouamra-Mechemache, Réquillart, & Treich, 2020). Due to the high intake of red and processed meat in high-income countries, the World Health Organization recommends limiting this consumption (WHO, 2015). This leads to the question: how can we convince others to reduce their meat consumption?

Individuals obtain information on how to behave by observing others in social settings (Rimal & Real, 2005). Meat consumption can be seen in many social and public settings, and most default options in restaurants include meat (Sparkman & Walton, 2017). Consuming meat is integrated into people's everyday lives, routines, and habits on such a large scale that it becomes the norm (Joy, 2010). Norms are described as …Descriptive norms are formed by perceiving others behave in a specific way, by looking at what others do (Cialdini, Reno, & Kallgren, 1990). People's own meat consumption patterns are perceived as normative because they see many others with a similar diet (Perkins & Berkowitz, 1986).

On the contrary, injunctive norms refer to the extent to which influential others expect individuals to behave in a certain way. It is behaviour that is seen as valued and appropriate by others (Cialdini, Reno, & Kallgren, 1990). Having a healthy, balanced diet as well as behaving in a sustainable way could be expected as injunctive norms. This can lead to a conflict of those two norms: the descriptive norm gives information that many others consume meat, but influential others highlight the importance of reducing meat consumption. Cialdini, Reno and Kallgren (1990) stated that in such case, the particular social norm - injunctive or descriptive- is unlikely to change behaviour, unless it is salient and focal at the time of the behaviour.

In the case of meat consumption, behaviour change is particularly difficult because it is integrated into people's everyday lives, routines, and habits. The confrontation with the impact of meat consumption often leads to denial. Joy (2010) concluded that there are three justification strategies meat eaters use to justify their behaviour, known as *the three Ns of meat justification.* The first strategy is believing that meat consumption is *normal,* socially accepted behaviour which most people expect from us and can be seen at many social and public places. The second justification strategy for meat consumption is *natural,* meat consumption is consistent with human nature, written in human biology, and it is what we naturally crave. The final justification for meat consumption is the idea that it is *necessary,* essential for a healthy and balanced diet which is needed to survive and become strong individuals. Additional research by Piazzi and colleagues (2015) concluded that people enjoy eating meat and associate meat with satisfaction, leading to *nice* as a fourth *N* of meat justification. These four *Ns* stand in the way of behaviour change.

Perkins and Berkowitz (1986) reasoned that because norms have influence on behaviour, when normative beliefs change, the behaviour will follow. Describing that change in others, is known as *dynamic norms*. *Static norms* on the contrary, describe stable and solid behaviour in others (Sparkman & Walton, 2017). In situations where a current norm is difficult to change because it is seen as completely normal and deeply integrated into people's daily lives as with meat consumption, drawing attention to a change in others might influence attitude. Sparkman and Walton (2017) reasoned that seeing an ongoing change in others, anticipating a changing future world in which this change becomes salient, conforms people to that dynamic norm in the present. Their online study examined if dynamic norms change people's interest in eating less meat compared to the effect of static norms. Half of the participants were exposed to a dynamic norm stating that 'in the last five years, 30 percent of the Americans have now started to make an effort to limit their meat consumption'.

Participants in the static norm group were exposed to the message that 'now 30 percent of the Americans make an effort to limit their meat consumption'. They concluded that exposure to the dynamic norm increased the interest of eating less meat, compared to the static norm. Based on their findings, we examine if exposure to social norms has a negative impact on the attitude towards meat consumption. The first hypothesis is formulated as:

Hypothesis 1. The attitude towards meat consumption will be more negative after exposure to a dynamic or a static norm compared to no norm exposure.

Additionally, Sparkman and Walton (2017) found that when participants were exposed to a dynamic norm about meat consumption, their interest in eating less meat increased, compared to participants who were exposed to a static norm. Based on their findings, this current study examines if exposure to dynamic norms leads to a more negative attitude towards meat consumption. That second hypothesis is formulated as:

Hypothesis 2. The attitude towards meat consumption will be more negative when exposed to a dynamic norm than exposed to a static norm.

Finally, Kallgren, Reno and Cialdini (2012) found that strong personal norms can stand in the way of conforming into a new norm. For those who consume more meat, it is possible that exposure to a dynamic norm leads to cognitive dissonance: a gap between the current behaviour (frequent consumption of meat) and cognition (knowledge of the negative impact of meat consumption on the environment, health, and animal suffering). People who endure this cognitive dissonance, use strategies to reduce this discrepancy between behaviour and cognition (Losch & Cacioppo, 1990). Individuals use avoidance, dissociation, and denial as strategies to reduce their perceived cognitive dissonance (Rothgerber, 2014). Assumably, the attitude of participants in current study who consume more meat, could be less influenced by exposure to social norms. The third hypothesis is formulated as:

Hypothesis 3. For people who eat more meat, the influence of social norms on attitude

is less strong than for people who eat less meat.

Figure 1 gives an overview of the conceptual framework.

Meat consumption

Social norms		Attitude towards meat consumption
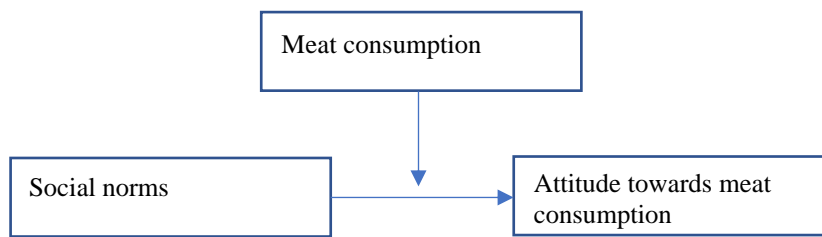
Figure 1. Conceptual framework of the variables.

Methods

Participants

For this research G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) was used to perform an a priori power analysis. The effect size for this analysis was estimated from a similar study done by Sparkman and Walton (2017). Indicating that the effect size is standardized mean difference was $f^2 = .1$, a small to medium effect size. Power analysis was performed with $\alpha = .05$, power $= .80$, and five numbers of predictors. Based on the G*Power analysis $n = 200$ are required in this study to find a difference between the groups.

For this present study 312 participants were gathered through convenience sampling from the researcher's social network and Sona System, a website used by Utrecht University. In total, 71 participants were excluded because of missing data. 18 others were excluded because they indicated that they ate meat less than once a week. This resulted in 223 participants included in the present study. The age of the participants ranged from 18 to 85 years ($M = 38.98$; $SD = 17.19$). Most of the participants identified themselves as woman ($n = 138$) and the two most common highest completed education levels were senior secondary vocational education ($n = 69$) and university of applied sciences ($n = 66$).

Procedure

This study used a between-subjects design, with two experimental groups: the static norm-group and the dynamic norm-group. The control group consists of no norm. This manipulation is based on the study done by Sparkman and Walton (2017) where they studied a similar effect, without the use of a control group. For this study Qualtrics is used to conduct an online survey in Dutch, because of the nationality of the participants. In the beginning of the survey, the participants filled out an informed consent with information about the aims, content, duration, confidentiality, and anonymity of the study. This was followed by the first question about their average meat consumption. In this question was explained that there are

on average 21 consumption moments a week (breakfast, lunch, and dinner for seven days) and asked on how many of those 21 moments the participants consume meat. This makes it easier for participants to estimate their meat intake instead of asking for the number of grams. Next came the demographics as age, gender, education and living situation. This was followed by their dietary identity: a questionnaire to measure the extent to which the participants could identify themselves as a meat eater, omnivore, vegetarian, vegan and flexitarian on a five-point Likert-scale for each item. This questionnaire was constructed by Graça, Calheiros, and Oliveira (2015) and proved to have high internal consistency ($\alpha = .93$). This was followed by the manipulation of the social norms. In the static norm, the participants read:

‘An article was recently published by *RTL Nieuws* with the headline: 'Fewer Dutch people see themselves as meat eaters'. It stated that research by *Vegamonitor* in 2020 has shown that almost half of the Dutch (48%) disapprove of eating meat every day. More than half of Dutch households (56%) make an effort to limit their meat consumption. This means that almost 6 out of 10 people do not eat meat several times a week (*RTL Nieuws*, 22 January 2021).’ The participants in the dynamic norm read that:

‘An article was recently published by *RTL Nieuws* with the headline: 'Fewer and fewer Dutch people see themselves as meat eaters'. This article stated that research by *Vegamonitor* in 2020 has shown that the attitude of the Dutch towards meat consumption is changing. Almost half of the Dutch (48%) now disapprove of eating meat every day. More than half of the Dutch (56%) have also made more effort in the past two years to reduce their meat consumption (*RTL Nieuws,* 22 January 2021).’

The control group was showed no norm. Right after the manipulation followed the questionnaire to measure attitude towards meat consumption. This questionnaire had previously been used by research of Berndsen and van der Pligt (2004). To measure the participants' attitude five statements were given. Each statement had a positive or negative

answer. One of the questions was: 'I find meat consumption….' and could be answered with 1) pleasant or 2) unpleasant. The participants were made aware that they only had 30 seconds to fill out those five questions on attitude. The 30-second time limit on the attitude questionnaire was designed to limit participants to answer with only readily accessible beliefs (Kallgren & Wood, 1986). The survey ended with the question about their willingness to reduce meat consumption because Berndsen and van der Pligt (2004) reasoned that people with a more conflicting attitude towards meat consumption, who struggle between a negative and positive attitude towards meat consumption, reported more willingness to consume less meat. This study examined the same question on a 5-point Likert-scale from 1) not willing at all to 5) very willing.

Results

Descriptive statistics

For this study IBM SPSS statistics version 27 is used to conduct the data analyses. The analyses included 223 participants and their meat intake varied from 1 to 21 moments a week, with a weekly average meat intake of $M = 9.27$ ($SD = 4.56$). Attitude towards meat consumption was measured as the sum of the given answers on five binary questions concerning attitude. The variable 'total attitude' varied from 0 to 5, with an average of $M = 1.50$ ($SD = 1.87$). A high score on total attitude meant that the participant stood negative towards meat consumption, meaning the average attitude towards meat consumption of this sample was quite positive. The willingness to consume less meat was measured on a five-point Likert scale (1: not willing at all, 5: very willing). The average willingness to consume less meat was $M = 3.75$ ($SD = 1.03$). Dietary identity was measured with five questions to which extent you could identify yourself as 1) meat eater, 2) omnivore, 3) vegetarian, 4) vegan and 5) flexitarian on a five-point Likert-scale for each item from 1) not at all to 5) very much). The average identification with 'meat eater' was $M = 3.62$ ($SD = 1.09$), omnivore $M = 3.91$ ($SD = 1.02$), vegetarian $M = 1.94$ ($SD = 1.00$), vegan $M = 1.22$ ($SD = 0.66$) and flexitarian $M = 2.16$ ($SD = 1.30$).

Main analysis

A general linear model was used to answer the research question. The assumptions were met, and no outliers were found. The model was significant $F(5, 217) = 3.65$, $p = .003$, partial $\eta^2 = .08$. The main effect of current meat consumption on attitude was found significant $F(1, 217) = 16.67$, $p < .001$, partial $\eta^2 = .07$. Higher current meat consumption was related to a more positive attitude towards meat consumption. The results show no significant main effect of social norms on attitude $F(2, 217) = .42$, $p = .67$, partial $\eta^2 = .004$.

There was no significant effect on the interaction of social norms and meat consumption on attitude $F(2, 217) = .44$, $p = .64$, partial $\eta^2 = .002$.

The mean score of attitudes was the most negative in the static norm group $M = 1.66$ ($SD = 1.95$), followed by the control group $M = 1.52$ ($SD = 1.96$) and the dynamic norm group $M = 1.33$ ($SD = 1.72$) as can be seen in Figure 2. The mean differences between the different groups were not significant.
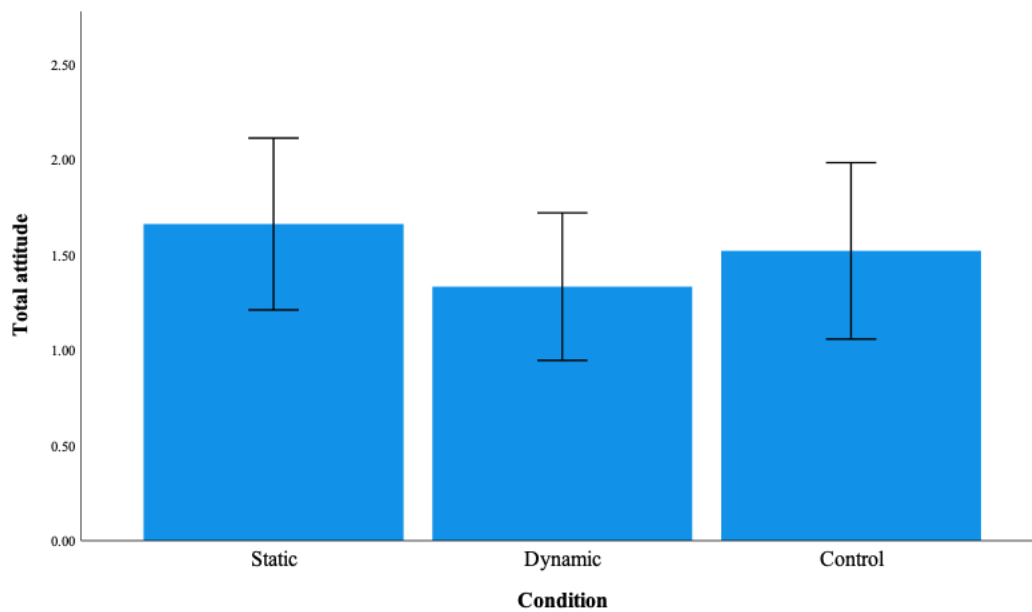
Figure 2. Average attitude towards meat consumption per group. A high score means a more negative attitude towards meat consumption.

Additional analyses

Besides the main analysis, we explored the data for significant mean differences in age and gender because of significant findings in previous studies (Lea &Worsley, 2002; Gossard & York, 2003; Holm & Møhl, 2000; Ruby, 2012). Using one-way ANOVA we found a significant effect of age on attitude towards meat consumption, $F(2, 245) = 5.74$, $p = .004$. The age group 26–49 reported a significantly more negative attitude towards meat

consumption compared to the age groups 50-85 and 18-25. Furthermore, there was a significant effect of age on identification with the term 'vegetarian', $F(2, 235) = 3.77$, $p = .02$. The age group 26-49 identified themselves significantly more as vegetarian compared to 18-25 year olds. Finally, 26-49 year olds identified significantly more with the term 'flexitarian' compared to both 50-85 and 18-25 year olds, $F(2, 227) = 6.19$, $p = .002$. An overview of the mean differences for age is presented in Table 1.

Table 1

Descriptive statistics of age differences

	18-25 n = 77		26-49 n = 83		50-85 n = 88		Mean differences[1]	
	M	*SD*	*M*	*SD*	*M*	*SD*		
Weekly meat consumption	9.42	4.29	8.77	4.73	9.60	4.69	*ns*	
Attitude towards meat consumption	1.28	1.72	2.05	1.94	1.11	1.81	**	26-49 vs. 50-85 26-49 vs. 18-25
Willingness to consume less meat	3.61	1.14	3.94	1.07	3.68	0.87	*ns*	
Identification with term 'meat eater'	3.62	1.09	3.52	1.17	3.64	0.99	*ns*	
Identification with term 'omnivore'	3.91	1.02	4.06	0.92	3.71	1.15	*ns*	
Identification with term 'vegetarian'	1.94	1.00	2.33	1.05	1.97	0.93	*	26-49 vs. 18-25
Identification with term 'vegan'	1.22	0.66	1.28	0.59	1.24	0.61	*ns*	
Identification with term 'flexitarian'	2.16	1.30	2.73	1.39	2.06	1.22	**	26-49 vs. 50-85 26-49 vs. 18-25

[1]*Note.* Mean differences analysed using one-way ANOVA
   * Mean difference is significant at $p \leq .05$
   ** Mean difference is significant at $p \leq .01$
   *** Mean difference is significant at $p \leq .001$

Next, we found several mean differences for gender. Using regression analysis, we found that women reported a lower amount of weekly meat consumption than men, with a mean difference of -1.78, 95% confidence interval (CI) for the difference in means = [-3.11, -0.45] and this difference was significant $t(147.78) = -2.65$, $p = .009$, but the effect was small $d = .3$. Women report a more negative attitude towards meat consumption than men, with a mean difference of .74, 95% CI for the difference in means = [0.24, 1.24]. This difference was found significant $t(189.80) = 2.92$, $p = .004$ and medium effect size $d = .4$. In addition, women are more willing to consume less meat than men with a mean difference of .68, 95% CI for the difference in means = [0.38, 0.99] and this difference was found significant $t(126.31) = 4.43$, $p < .001$. The size of the effect is medium-large $d = .6$. Finally, we found that men identify themselves more with the term 'meat eater' than women, with a mean difference of -.50, 95% CI for the difference in means = [-0.80, -0.21]. This difference was found significant $t(206) = -3.35$, p $< .001$ with a medium effect size $d = .4$. The mean differences for gender can be found in Table 2.

Table 2

Descriptive statistics of gender differences

	Women n = 157		Men n = 91		
	M	*SD*	*M*	*SD*	Mean differences[1]
Current meat consumption	8.52	4.13	10.55	5.03	**
Attitude towards meat consumption	1.77	1.95	1.07	1.66	**
Willingness to consume less meat	3.96	0.85	3.39	1.21	***
Identification with term 'meat eater'	3.40	1.08	3.92	1.01	***
Identification with term 'omnivore'	3.77	1.03	4.10	1.02	*ns*
Identification with term 'vegetarian'	2.14	1.02	1.99	0.98	*ns*
Identification with term 'vegan'	1.27	0.68	1.20	0.50	*ns*
Identification with term 'flexitarian'	2.42	1.40	2.19	1.22	*ns*

[1]*Note.* Mean differences analysed using independent t-test
 * Mean difference is significant at $p \leq .05$
** Mean difference is significant at $p \leq .01$
*** Mean difference is significant at $p \leq .001$

Discussion

The aim of this study was to see if attitude towards meat consumption could change by exposing social norms. The first hypothesis of this study that attitude towards meat consumption will be more negative after people have been exposed to social norms, was rejected. This finding was inconsistent with previous research by Goldstein, Cialdini and Griskevicius (2008) who found that highlighting social norms led to sustainable behaviour. Their field study proved that drawing hotel guests' attention to sustainable norms ('the majority of the guests reuses their towels') led to the desired behaviour. Future research could examine the impact of social norms on meat consumption in a field study, comparable with Goldstein, Cialdini and Griskevicius' research to examine the participants' behaviour after being exposed to meat reduction norms in a real life setting as a restaurant or supermarket.

The second hypothesis that attitude towards meat consumption will be more negative when exposed to a dynamic norm, compared to a static norm, was rejected. There was even a small, but insignificant difference in the opposite direction as assumed. The static norm reported the most negative attitude towards meat consumption, but this insignificant difference can be coincidental. The findings of this current study were inconsistent with previous findings of Sparkman and Walton (2017) arguing that exposure to dynamic norms increased the interest of eating less meat. This inconsistency might be due to the manipulation, which could have been not strong enough. The current study used a similar manipulation as Sparkman and Walton (2017) used in their study, but we recommend future research to pre-test the manipulation of the social norms to control if the difference is salient enough.

Another possible explanation for the inconsistency in the second hypothesis could be the strength of the manipulation in order to change attitude. Sparkman and Walton (2017) concluded that dynamic norms increased the interest of eating less meat, however the current

study examined if dynamic norms had negative impact on attitude towards meat consumption. Krosnick and Petty (1995) argued that stability of attitude moderates the strength of attitude. Strong attitudes are more stable in different situations and over time, where weak attitudes are less accessible and more vulnerable to change under social influence. Since meat consumption is a big part of people's day-to-day lives, attitude towards the consumption of meat is stable and people tend to not question their beliefs (Haidt, 2001).

The last hypothesis that for people who eat more meat, the influence of social norms on attitude is less strong than for people who eat less meat, was rejected. Meat consumption did not moderate the effect between social norms and attitude. The main effect of meat consumption on attitude was significant. However, there was no main effect found of social norms on attitude. This is inconsistent with the expectation that people who consume more meat, might experience feelings of cognitive dissonance (Losch & Cacioppo, 1990). It is plausible that cognitive dissonance might not arise after one single exposure to a norm incongruent of one's own point of view. Our recommendation for future research would be to expose participants to dynamic norms on meat reduction multiple times to see if more exposure would affect their attitude over time.

Further, we examined if descriptive information about the sample corresponded with previous research. We found several differences in age and gender. The participants from 26 to 49 years reported the most negative attitude towards meat consumption compared to the other two age groups. Additionally, 26- to 49-year-olds could identify themselves more with the term 'vegetarian' compared to 18- to 25-year-olds and identify themselves more with the term 'flexitarian' compared to both 18- to 25- and 50- to 85-year-olds in this sample. These differences in age are congruent with Lea and Worsley's findings (2002).

We also found gender differences. Women reported a lower average amount of meat consumption than men, consistent with findings of Gossard and York (2003). Additionally,

women reported a more negative attitude towards meat consumption, consistent with previous findings of Holm and Møhl (2000). Women were also more willing to consume less meat, which was consistent with previous findings of Ruby (2012). Finally, men can identify themselves more with the term 'meat eater' than women can, consistent with findings of Rothgerber (2014), who reasoned that this effect is stronger for men that endorse traditional male roles. The differences found in age and gender were explorative in nature but can contribute to a better understanding and aimed recommendation for future research. Berndsen and van der Pligt (2004) concluded that people with a more median attitude towards meat consumption, were more willing to consume less meat in the future. Based on this knowledge and current study's findings, we recommend future research to see if social norms have more impact on the attitude of especially women and 26- to 49-year-olds.

Since all hypotheses have been rejected, we assumed that in this study the manipulation was not strong enough to change attitude. Sparkman and Walton (2017) reasoned that presenting a change in others, may inspire to change as well, because of new information, a newly formed reason to change or the insight that change is possible. By presenting dynamic norms, it anticipates people to a changing, future society. It also increases the perceived importance of a specific behaviour to others (Sparkman & Walton, 2017). This makes us suggest that future research could examine the impact of social norms on the attitude over a period of time. People change along when changing norms become more salient. However, reducing meat consumption is perhaps more difficult because it is integrated in people's every-day-lives. The suggestion of measuring attitude over a period of time, with multiple exposure moments in combination with the growing knowledge of the negative impact of meat consumption on the environment (OECD, 2021), animal suffering (Ruby, 2012) and human health (Godfray et al., 2018; IARC, 2015) may decide people to decrease their meat consumption.

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