"TO MEAT OR NOT TO MEAT"

Exploring the effects of social norm messages on lowering meat consumption



Author:	Amber B. Bruynzeel
Student number:	S1908820
Supervisors:	Dr. M. Galetzka & Dr. A. D. Beldad
Study:	Master Communication, Marketing & Design
Date:	August, 2019
Place:	University of Twente, Enschede

Abstract

Background and purpose - Since our meat eating habits have a detrimental negative impact on our environment and animal welfare, a change in our dietary habits is needed. Moreover, the production of meat has a negative impact on the environment in terms of biodiversity, greenhouse gas emission, water supply, and animal welfare. Although most individuals do believe that the environment should be protected, and animal welfare is of high value, behavior is contradictory. Furthermore, the average meat intake within the Netherlands is approximately 6 days a week. Therefore, this study will focus on finding effective ways to lower meat consumption, through social norm messages. According to the Focus Theory of Normative Conduct, two types of norms can be distinguished: descriptive norms, and injunctive norms. Although both social norms are extensively explored within the field of health and other fields regarding social desired behavior, it is not widely researched in the field of meat consumption. Therefore, this study contributes by investigating the (possible) effects of social norm messages, on the intention to consume less meat through an online experiment.

Methods - This study used a 2 (descriptive norm present vs not present) x 2 (injunctive norm present vs not present) x 2 (positively vs negatively framed) in between-subject design, where N=281 individuals were subjected to one out of 8 unique conditions. Every condition contained either an injunctive norm, a descriptive norm, a combination of both norms, or no norms (control condition), and all conditions were either negatively or positively framed. Besides the norms, all conditions contained information about the negative effects of meat consumption on the environment and animal welfare, to stress the importance of a lower meat consumption. The study was conducted among adults of 18 years and older, who consumed meat at least once a week.

Results - Although no main effects were found, there were significant interaction effects found. The outcomes implied that descriptive norms have a negative influence on behavioral intention and behavior choice, when combined with an injunctive norm. Moreover, this negative effect only occured when both norms were used in a negatively framed message, as opposed to the positive frame. When combining descriptive and injunctive norms in a negative frame, the intention to lower meat intake significantly lowers, and individuals are 10 times less likely to choose for a meatless option as opposed to a meat option. Additionally, feelings of moral obligation were stronger, among participants who consumed high amounts of meat. Moreover, participants who ate meat 5 to 7 days a week (high meat intake), felt more obliged to lower their meat consumption than participants with a moderate (i.e. 3 to 4 day a week) or low (1 to 2 days a week) meat intake. On the contrary, attitude towards animal welfare decreased, when meat intake increased.

Conslusion - Presumably, this difference in outcome can be explained by Cognitive Dissonance Theory, which explains that feelings of discomfort arise, when behavior and beliefs are discrepant. Therefore, participants who have higher contrast between their beliefs (e.g. it is best to eat less meat), and their behavior (e.g. eating a lot of meat), have stronger feelings of guilt because of the high discrepancy, and thus feel more obliged to consume less meat, and more positive towards eating less meat. Another explanation for the negative effect of the combined social norms in a negative frame, could be assigned to guilt appeal. Moreover, this message in particular could have activated high feelings of guilt because of its (quite extreme) negative content.

Regarding the interaction effects found in this study, caution is highly advised when using a combination of both injunctive and descriptive norms within a negative frame, since a negative effect on behavior can occur.

Keywords: behavioral change, social norms, messaging, meat consumption, environmental impact, animal welfare, descriptive norms, injunctive norms, focus theory of normative conduct

Table of contents

1. Introduction	6
2. Literature review	9
2.1 Social norms and behavioral change	9
2.2 Types of social norms	9
2.4 Framing the norm	12
2.5 Mediator, moderator and covariates	13
3. Methods	16
3.1 Experimental design	16
3.2 Participants	17
3.3 Procedure	
3.4 Sample characteristics	19
3.4.1 Distribution of the sample	19
3.5 Normalitly check of the sample	20
3.6 Measurements	20
3.6.1 Preliminary analysis of the constructs	20
3.6.2 Constructs	20
3.6.3 Reliability of the constructs	22
3.6.4 Validity of the constructs	22
4. Results	24
4.1 Manipulation check	24
4.2 Main effects	25
4.2.1 Behavioral intention	25
4.2.2 Behavior choice	27
4.3 Mediation analysis; personal norm	
4.3.1 Behavioral intention	
4.3.2 Behavior choice	
4.4 Moderation analysis; motivation to comply to the norm	
4.5 Covariate analysis; attitude towards animal welfare	
4.6 Additional analysis	
4.6.1 Type of meat consumer	
4.7 Hypothesis	
5. Discussion	
5.1 Social norms	
5.2 Framing the message	
5.3 Moderators and mediators	
6. Limitations and recommendations	

	6.1 limitations	40
	6.2 Recommendations	40
7.	Conclusion	41

1. Introduction

Since the demand for meat is expected to rise in the coming years and the consumption of meat has a detrimental impact on the environment and animal welfare, there is an urgent need to shift towards a more sustainable diet (Aiking, 2014; Charles, Godfray, Aveyard, Garnett, Hall, Key, 2018; Garnett, 2008; Machovina, Freeley, Ripple, 2015; Tobler, Visschers, Siegrist, 2011) More specifically, the production of meat has negative impact on the environment in terms of biodiversity (Machovina et. al., 2015), greenhouse gas emission, water supply, and animal welfare (Aiking, 2014; Charles et. al., 2018; de Boer & Aiking, 2017; Machovina et. al., 2015). Therefore, a more sustainable diet with lower meat intake is necessary to decrease environmental impact and improve animal welfare (Aiking, 2014; de Boer & Aiking, 2017; Charles et. al., 2018; Machovina et. al., 2015; Sutton & Dibb 2013).

However, the awareness among consumers of the negative impacts of meat consumption on the environment and animal welfare, several studies concluded that the awareness among consumers is low (Hartmann & Siegrist, 2017; Hoek, Pearson, James, Lawrence, Friel, 2017; Macdiarmid, Douglas, Campbell, 2016; Stea & Pickering, 2017). Regarding environment, consumers assume that the production of meat has low environmental impact, and perceive their meat consumption playing a minimum role within global context, regarding environmental change (Hoek et. al., 2017). Furthermore, the terms "environmentally friendly" or "environmentally sustainable" are mainly associated with nonfood behaviors, such as saving energy (Hartmann & Siegrist, 2017; Hoek, et al., 2017; Macdiarmid, et. al., 2016; Stea & Pickering, 2017). Concerning the impact of meat consumption on animal welfare, awareness appears low as well. Moreover, the Sentience Institute (2017) in America found that among participants, 49% supported a complete ban of animal factory farming and 69% claimed that "factory farming is one of the most important social issues in the world today". On the contrary, consumers assume that farm animals in general are treated humanely, while evidence shows the opposite is true (Prunty & Apple, 2013; Sentience Institute, 2017). Although consumers might hold the opinion that environmental and animal welfare complications surrounding the meat industry are important and should be dealt with, many consumers do not act consistently (de Bakker & Dagevos, 2012). These contrasting findings could be an outcome of the lack of awareness surrounding the topic. However, different barriers can arise when attempting to raise awareness respecting the negative impacts of the meat industry on animal welfare, and the environment.

When it comes to raising awareness among consumers with the goal to lower their meat consumption, different perceived barriers arise (Graça, Calheiros, Oliveira, 2015; Machovina et. al., 2015; Pohjolainen, Vinnari, Jokinen, 2015; Stea & Pickering, 2017). Therefore, it is important to comprehend what motivates consumers to eat meat, or in other words, what demotivates consumers to lower their meat intake (Hartmann & Siegrist, 2017; Stea & Pickering, 2017).

Firstly, people appear to be unwilling to give up or reduce their meat consumption, for reasons of taste, perceived health impact (Hoek et. al., 2017; Macramid et. al., 2016; Stea & Pickering, 2017),

habit (Zur & Klöckner, 2014), perceived increased cooking effort (Hoek et. al., 2017; Pohjolainen et. al., 2015; Stea & Pickering, 2017), and perceived lack of influence on the environment (Hoek et. al., 2017; Stea & Pickering, 2017). Hereby, according to a study of Macdiarmid et al. (2016), meat is considered of high social value (e.g. eating meat on special occasions) and consequently, perceived social pressure can make it more difficult to lower the consumption of meat (e.g. people do not want to feel left out by not eating meat). As such, since strong habit supports the consumption of meat, breaking the pattern can be difficult (Zur & Klöckner, 2014). These patterns of attachment towards eating meat, may hinder willingness, and consequently, decrease the intention to lower meat consumption (Graça et. al., 2015). These patterns of attachment suggest, that the willingness and intention to consume less meat, is low to start with. Hereby, the perceived lack of influence on the environment, perceived health impact, and perceived increased cooking effort, could be explained by the lack of awareness concerning the topic of meat consumption, as mentioned previously.

Secondly, regarding the impact of the meat industry on animal welfare and the environment, cognitive dissonance can occur when people are confronted with the negative consequences of the meat industry on the environment, and animal welfare (Hoogland, de Boer, Boersema, 2005; Hoek et. al., 2017; Joy, 2011; Macdiarmid, et. al., 2016; Prunty & Apple, 2013; Tobler et. al., 2011). This cognitive dissonance can be explained by Cognitive Dissonance Theory: the conflict between attitudes and behavior causes a feeling of mental discomfort, which leads to either a change in behavior or attitude, to reduce this discomfort (Festinger, 1957). The discomfort by dissonance, makes it unenjoyable to think about where meat comes from, what environmental impact it has, and how it gets processed, before consuming it (Bastian, Loughnan, Haslam, Radke, 2012; Hoogland, 2005). Moreover, the discrepancy between consumers' beliefs: animals should not be harmed, and the environment should be protected, and their behavior: making animals suffer and contributing to climate change by consuming meat, results in a feeling of discomfort (Hoek et. al., 2017; Macramid et. al., 2016; Prunty & Apple, 2013; Tobler et. al., 2011). To cope with this unpleasant feeling that results from cognitive dissonance, individuals tend to change their beliefs, to be able to pursue their meat habits (Bastian et. al., 2012; Hoogland et al., 2005; Joy, 2011; Loughnan et. al., 2010; Šedová, Slovák, Ježková, 2016). In a study among environmental students (who were very much aware of the impact of the meat industry on the environment), cognitive dissonance occured as well (Šedová et. al., 2016). Moreover, even though the environmental students convinced themselves that organic or small farming was a sufficient way to lower the impact of meat consumption on the environment, the majority of participants bought meat that originated from factory farms (Šedová et. al., 2016). They lowered their cognitive dissonance, by changing their beliefs: stating that the availability of the organic meat was low and that prices were too high (Šedová et. al., 2016). Regarding animal welfare, people tend to lower their cognitive dissonance, by changing their perception of meat and animals (Joy, 2011). For example, by separating meat from animals and denying mind of animals (i.e. animals are not intelligent and therefore less worthy of living than humans) that are "ought to be eaten" (e.g. cows, pigs, chickens), people can proceed eating meat without feeling guilty (Bastian et. al., 2012; Hoogland et al., 2005; Joy, 2011; Loughnan et. al., 2010). Because of cognitive dissonance, simply informing consumers and creating awareness concerning the impact of the meat industry on animals and the environment, might be ineffective. This was confirmed by a study of Hoogland et. al. (2005) who found that informing consumers on animal welfare might not be enough to persuade them into lowering their meat consumption, as they might avoid thinking about the living animal when buying meat. Keeping in mind the complexity of the previously mentioned barriers, it is important to find effective ways of communication regarding the topic of meat consumption (Stea & Pickering, 2017), that presumably goes beyond informing consumers on the topic.

When it comes to effective ways of communication, social norms were found to be a very effective way to influence socially desired behavior. Although there is convincing evidence on how social norm messages can be very effective when it comes to changing social desired behavior regarding topics such as: energy conservation (Schultz et. al. 2007; Alcott, 2011), environmental conservation (Cialdini et. al., 2006; Goldstein et. al., 2008), drinking alcohol (Borsari & Carey, 2003; Neighbors et. al., 2007; Pedersen et. al., 2017; Rimal & Real, 2005), littering (Cialdini et. al., 1991; De Kort et. al., 2008), and food choice (Burger et. al., 2010; Mollen et. al., 2013; Robinson et. al., 2014), it is not yet researched widely within the field of meat consumption. Therefore, this study contributes by examining this gap, and address the following research question: "What is the effect of social norm messages on the intention to lower meat consumption among Dutch consumers?".

2. Literature review

2.1 Social norms and behavioral change

Nudging, "which is any factor that significantly alters the behavior of Humans" (Thaler et. al., 2008 p.8) through the use of social norms, has been researched extensively in the field of behavioral economics (Alcott, 2011; Borsari & Carey, 2003; Burger, Bell, Harvey, Johnson, Stewart, Dorian, Swedroe, 2010; Cialdini, et. al., 1991; De Kort, McCalley, Midden, 2008; Goldstein et. al., 2008; Keizer, Lindenberg, Steg, 2008; Lally, Bartle, Wardle, 2011; Mollen, Rimal, Ruiter, Kok, 2013; Pedersen et. al., 2017; Robinson, et. al., 2014; Staunton, Louis, Smith, Terry, McDonald, 2014; Schultz, Nolan, Cialdini, Goldstein, Griskevicius, 2007; Thaler & Sunstein, 2008). As mentioned before, there is convincing evidence on how social norm messages can be effective when it comes to changing social desired behaviors (Burger et. al., 2010; Cialdini et. al., 2006; Pedersen et. al., 2017) For example, in a study by De Kort et. al. (2008), social norm messages were displayed on trash cans, in order to motivate people to discard their trash in the cans (instead of on the ground). The results of the study showed that the littering rate in the area where the trash cans were placed, was significantly reduced (by 50%). More effective examples will be elaborated on in the next sections.

2.2 Types of social norms

According to the Focus Theory of Normative Conduct (Cialdini et. al., 1991) two different types of social norms can be distinguished; descriptive and injunctive norms. Descriptive norms are the norms that are perceived as what most people do, while injunctive norms refer to what is perceived as what most people approve or disapprove of (Cialdini et. al., 1991). An effective example of using these different type of norms, are presented in an experiment by Cialdini et. al. (2006) who organized a reallife experiment in the Petrified Forest National Park in Arizona. The park had a problem with visitors stealing petrified wood from the park, which endangered the natural environment of the park. Different signs were placed in the park, displaying injunctive and descriptive norms messages, while petrified wood was spread throughout the park, to tempt visitors into stealing it. A significant difference in stealing was found between the injunctive norm message: "Please don't remove the petrified wood from the park" (Cialdini et. al., 2006, p.8) which was combined with an image that depicted a visitor stealing with a red circle-and-bar over its hand, and the descriptive norm message: "Many past visitors have removed the petrified wood from the park, changing the state of the Petrified Forest" (Cialdini et. al., 2006, p.8) which was combined with a picture of a visitor stealing the wood. Visitors exposed to the descriptive norm message were more likely to steal petrified wood, than visitors exposed to the injunctive norm message. Notable about the results from the study of Cialdini et. al. (2006) was, that the stealing rate almost doubled when people were subjected to the descriptive norm. It should be

mentioned however, that the descriptive norm was very clearly emphasizing the negative behavior, and that there was no use of a positively framed descriptive norm to explore difference in outcome.

When making salient what most people do, or not do, people have the tendency to comply to the descriptive norm, which in this example, was stealing the petrified wood from the forest. This negative effect is also known as the "boomerang effect" (Schultz et. al. 2007; Thaler & Sunstein, 2008), which explains the possible negative outcome when using descriptive norm messages. This negative effect can also occur when the positive descriptive norm is made salient. An example of this, was established by a study of Allcott (2011), who conducted an experiment among households using descriptive and injunctive norms messages, with the goal of lowering energy use. When using the descriptive norm (stating the average energy use of households in the neighborhood) which did not emphasize negative norm behavior in this case, the boomerang effect appeared: households who scored lower in energy use than the average of their neighborhood, increased their energy use. Some studies showed that the boomerang effect can be prevented by combining the descriptive norm with an injunctive norm, by for example adding a smiley which embodies the injunctive norm (Alcott, 2011; Schultz et. al. 2007). In other words, combining the injunctive norm (e.g. what most individuals approve or disapprove of) with the descriptive norm (e.g. what most individuals do), can prevent that people who do not comply to the descriptive norm, alter their behavior to be in line with the descriptive norm. However, the boomerang effect mostly appears when the *undesired* descriptive norm has been made salient. Although the boomerang effect can appear when using descriptive norms, they can successfully influence behavior as well. An effective example of this is presented in an anti-littering experiment of Cialdini et. al. (1991), where the littering rate was higher in a littered environment (where the descriptive norm favored littering) than in a clean environment (where the descriptive norm opposed littering). In this example, the environment embodied the descriptive norm in either a positive or negative way, and in both cases, increased norm-consistent behavior. This is in line with the outcome of Borsari & Carey (2003), where college students were subjected to the drinking norm (i.e. the average amount of alcoholic drinks per student) through messages on their campus, and concluded that the descriptive norm messages significantly lowered alcohol intake. It should be noted however, that within the study of Borsari & Carey (2003), injunctive norms were tested as well and had a higher significant effect on behavioral change. Why the descriptive norm did still significantly change behavior, could be explained by the idea that most people tend to overestimate the social norm and adapt their behavior to the descriptive norm when confronted with it (Borsari & Carey, 2003; Burger et. al., 2010; Lally et. al., 2011; Robinson et. al., 2014). Because of this, although the descriptive norms refer to "what is *perceived* as what most individuals do" (Cialdini et. al., 1991), it might be that stating the *desired* descriptive norm, behavior can be influenced positively as well. For example, Goldstein et. al. (2008) concluded that individuals were more likely to reuse the towels in their hotel room when a descriptive norm stated that most guests already did reuse their towels (descriptive norm), while in fact, most guests did not.

Still, in the example of Goldstein et. al. (2008), only the effect of descriptive norms messages (as opposed to informative messages) were explored, while injunctive norms were not included.

In contrast to descriptive norms, injunctive social norms are established to be more widely applicable than descriptive norms within different populations (Cialdini et. al., 1991). Moreover, they do not have the risk of creating a "boomerang effect" and can be effective without combining them with descriptive norms (Alcott, 2011; Borsari & Carey, 2003; Cialdini et. al., 1991; Pedersen et. al., 2017; Schultz et. al. 2007;). This can be explained by the social disapproval, which can prevent individuals from acting in contrast to their perceived social norm, because their own internal standards differ from it (Pedersen et. al., 2017). For example, it can be liberating to find out that a peer supports environmental conservation efforts, which enables one to turn down the heat, without having the fear of social disapproval, even though the majority does not enact in the same behavior. Injunctive norms are also proven to be more effective when the personal norm (i.e. internal standards) is in contrast to the disclosed injunctive norm. This was established by a study of Cialdini et al. (1991), where the personal norm towards littering was measured, which consequently divided participants into two groups: having weak personal norms against littering (i.e. are not against littering), and having strong personal norms against littering (i.e. are against littering). When subjected to the injunctive norm (it is disapproved of when you litter), individuals with a strong personal norm against littering did not litter at all, and individuals with a weak personal norms against littering, littered significantly less (Cialdini et. al., 1991). Although an injunctive norm is less effective when the personal norm towards the desired behavior is contradictory (Cialdini et. al., 1991), it still positively affects the outcome of the desired behavior. According to Cialdini et. al. (1991) personal norms might only have effect on the outcome when activated, and can be only advantageous when they fit the desired social goals. In other words, when personal norms contrast the social desired behavior, social injunctive and descriptive norms might be less, or not effective.

Even though injunctive norms are found to be more widely applicable, and have a positive effect even when personal norms are against the suggested behavior (Alcott, 2011; Borsari & Carey, 2003; Cialdini et. al., 1991; Schultz et. al. 2007; Sunstein, 2008; Thaler & Pedersen et. al., 2017), descriptive norms have proven to affect behavior positively as well. More specifically, the descriptive norm can be effective when stating the desired norm, and can motivate individuals to adjust to the norm (Cialdini et. al., 1991; Goldstein et. al., 2008). Therefore, considering the findings above, and the lack of research within the field of meat consumption, both injunctive and descriptive norms will be considered by this study and will be used both individually and combined, to examine if there are different (interaction) effects between social norms and the desired behavior: motivate consumers to lower meat consumption.

2.4 Framing the norm

According to the Royal Institute for Public Health and Environment, (2016) the norm for meat consumption within the Netherlands on average, is approximately 6 days a week. Therefore, since the goal of this study is to explore if individuals comply to the norm of interest (i.e. injunctive, descriptive or both), this study will focus on the *desired* norm in contrast to the *actual* norm. Both injunctive and descriptive norm messages will be in line with each other, or in other words, both descriptive and injunctive norms will state the desired behavior, and therefore, not the actual norm. Although the actual norm (most Dutch individuals eat meat on a daily basis) is divergent from the desired norm (most Dutch individuals eat meat on a daily basis) is divergent from the desired norm (most Dutch individuals eat meat on a daily basis) and therefore, might find it favourable to consume less meat.

To prevent untrustworthiness of the exposed desired norm and consequently make it conceivable, it will be stated in general ("... that's why people eat less meat"), since stating an amount of meat per week might be unrealistic and therefore in risk of not being believable. With this, when for example stating that it is "the norm" to eat meat 4 days a week, people who eat less meat on a weekly basis, might consider increasing their meat intake because of the "boomerang effect". Furthermore, it might not motivate individuals that already eat meat 4 days a week, to lower their meat consumption. The "boomerang effect" will be prevented, since there will be no statement of an average meat intake of which individuals can compare their intake to. Also, regarding the boomerang effect, there will be no attention drawn to the negative behavior (most people eat meat), but on the contrary, the desired behavior will be stated (most people do not eat meat), which again, should prevent the "boomerang effect" from occurring. The content of the messages (besides the norms), will contain information about the effects of meat consumption on the environment and animal welfare, to emphasize the importance of the desired (normative) behavior.

All messages however, are at risk of not being effective, when they are not made salient to an individual's attention, as explained by the Focus Theory of Normative Conduct (Cialdini et. al., 1991). In other words, Focus Theory of Normative Conduct suggests, that without activating the norm (i.e. making the norm salient), behavior is not affected (Cialdini et. al., 1991; Cialdini, et. al., 2006). Therefore, it is important when using either type of social norm message, to draw the attention of the individual to the norm of interest (Cialdini et. al., 1991).

When it comes to attracting attention to the message, various studies concluded that negatively worded messages should create greater attention to the content, than positively worded messages (Cialdini, 2003; Caldini, 2006; Staunton et. al., 2014). Nevertheless, again, considering the absence of research within the field of meat consumption, all messages within this study will be manipulated in both a positive and a negative way. Additionally, both types of framing are expected to have a different

outcome in behavior: negatively framed messages are expected to have a greater positive outcome on behavior than positively framed messages (Cialdini, 2003; Caldini, 2006; Staunton et. al., 2014).

To inquire the possible main, and interaction effect(s) of social norm messages and framing on behavior, the following hypothesis were formed:

Framing

- *H1a:* A *positively framed* message has no effect on lowering meat consumption, as opposed to a negatively framed message.
- *H1b:* A *negatively framed* message has a positive effect on lowering meat consumption, as opposed to a positively framed message.

Injunctive norms x Framing

- *H2a:* A positively framed *injunctive norm* message has a positive effect on lowering meat consumption, as opposed to an informative message.
- *H2b:* A negatively framed *injunctive norm* message has a positive effect on lowering meat consumption, as opposed to an informative message.

Descriptive norms x Framing

- *H3a:* A positively framed *descriptive norm* message has a positive effect on lowering meat consumption, as opposed to an informative message.
- *H3b:* A negatively framed *descriptive norm* messages has a positive effect on lowering meat consumption, as opposed to an informative message.

Descriptive norm x Injunctive norm x Framing

- *H4a:* A positively framed *combined norm* message has a positive effect on lowering meat consumption, as opposed to an informative message, and both norms separately used.
- *H4b:* A negatively framed *combined norm* message has a positive effect on lowering meat consumption, as opposed to an informative message, and both norms separately used.

2.5 Mediator, moderator and covariates

Since the goal of this study is to influence behavior through social norms, it is important to consider the possible influence of motivation to comply to social norms. Reasonably, if a person is not concerned about social approval or disapproval, it is unlikely that the person in question will be susceptible to changing his or her behavior, according to the social norm he or she is exposed to. Therefore, motivation to comply to the norm will be taken into account as a moderator.

In line with this reasoning, attitude towards environment and animal welfare might also influence the effect of the overall message, since all messages contain information of the (negative) effects of meat consumption on the environment and animal welfare. In other words, when participants do not care about animal welfare or the environment to start with, reading about the impact of meat consumption, will presumably have less impact on them. Therefore, even though they might not directly influence the effectiveness of the norms, but might influence the effectiveness and even salience of the information in the messages, attitude towards animal welfare, and attitude towards environment and attitude towards animal welfare will be taken into account as covariates as well. Additionally, attitude towards lowering meat consumption will also be considered as a covariate, since a negative attitude towards meat consumption might also influence the outcome of the message.

Although Cialdini et. al. (1991) stated that the personal norm only had strong effect when it was made salient before the experiment, it can be, that the personal norm will be activated by being exposed to the social norms and/or information included in the different message types. Therefore, the personal norm will be considered as a mediator, since it could mediate the relationship between the different message types and behavioral outcomes.

An overview of the conceptual model of this study can be found in Fig. 1.



Figure 1. Conceptual Framework

To inquire the possible moderating, controlling and mediating effects of the covariates, personal and motivation to comply to the norm, the following hypotheses were formed:

Mediator

• *H5: Personal norm* mediates the relationship between the different message types and lowering meat consumption.

Covariates

- *H6a:* When the *attitude towards lowering meat consumption* is negative, all messages have no effect on lowering meat consumption.
- *H6b:* When the *attitude towards lowering meat consumption* is positive, all norm messages have a positive effect on lowering meat consumption, as opposed to the informative messages.
- *H7a:* When the *attitude towards environment is negative*, all messages have no effect on lowering meat consumption, as opposed to an informative message.
- *H7b:* When the *attitude towards environment is positive*, all norm messages have a positive effect on lowering meat consumption, as opposed to the informative messages.
- *H8a:* When the *attitude towards animal welfare is negative*, all messages have no effect on lowering meat consumption.
- *H8b:* When the *attitude towards animal welfare is positive*, all norm messages have a positive effect on lowering meat consumption, as opposed to the informative messages.

Moderator

• *H9: Motivation to comply to the norm* moderates the effectiveness of injunctive and descriptive norm messages on lowering meat consumption.

3. Methods

3.1 Experimental design

This study investigates if descriptive and/or injunctive norms, in negatively or positively framed message types, affect behavior through a 2 (descriptive norm present vs not present) x 2 (injunctive norm present vs not present) x 2 (positively vs negatively framed message) between-subject design (Fig. 2).



Figure 2. Factorial (2x2x2) in between subjects design. Type of framing is expressed as: + (positively framed) and – (negatively framed), and presence of variables are expressed as: 0 (not present) and 1 (present)

Participants in this study were randomly assigned to one of 8 conditions (see Fig. 3, Fig. 4, Fig. 5), with the instruction to pay attention to the following message. There was not a fixed time frame, and participants were instructed to continue if they had read the message thoroughly. Apart from the norms, all messages consisted of identical information about the (negative) impact of meat consumption on animal welfare and the environment. Furthermore, the only difference in information was between the negatively framed message (i.e. "By eating meat you use... and contribute to the suffering of animals and environment...") and the positively framed message (i.e. "By not eating meat you safe... and contribute to animal welfare and the environment..."). In each condition, the informational message was either adjoined by a descriptive norm (Fig. 3-A, Fig. 4-A), an injunctive norm (Fig. 3-B, Fig. 4-B), or a combination of both norms (Fig. 3-C, Fig. 4-C). All norm consisting messages were framed either in a positive frame (Fig. 3) or negative frame (Fig. 4). The control group (Fig. 5) was only subjected to the informational message, containing the same information about the effects of meat consumption on animal welfare and the environment as the norm consisting messages, and were similarly framed, but did not consist any norms.



Figure 3. Negatively framed norm messages, from left to right: descriptive norm (A); injunctive norm (B), combination of both injunctive and descriptive norms (C)



Figure 4. **Positively framed** norm messages, from left to right: descriptive norm (A); injunctive norm (B), combination of both injunctive and descriptive norms (C)



Figure 5. Messages **control group**, where the left message is negatively framed (A) en the right message is positively framed (B)

3.2 Participants

The majority of previous studies within the field of behavior economics on social norms, were conducted among male and female adults between the age of 18 and 65 years old. Since teenagers and children below 18 supposedly do not have full authority of their diet yet (e.g. they might not be in charge of what they eat), as they are still dependent on their caregiver(s), they will not be considered as the target group. Therefore, the target group for this study will be both female and male adults, with an age of 18 years or older. Additionally, since the goal of this study is to influence the intention to lower meat intake, this study targets individuals who consume meat.

3.3 Procedure

The experiment was conducted online through Qualtrics software, and was distributed by virtual snowball sampling through social network sites (Facebook, WhatsApp, Twitter & Instagram). The survey was structured as following: First, a welcome message, general aim of the study, terms of privacy, and the maximum duration of the survey (i.e. 10 minutes) was explained. Second, questions about demographics were asked in terms of age, gender, and level of education. Consequently, participants under the age of 18 were sent to the end of the survey, since they did not meet the target group requirements of this study. Third, participants were asked about their motivation to comply to the norm, attitude towards the environment, and attitude towards animal welfare. Fourth, participants were randomly assigned (with equal distribution through Qualtrics) to one of the eight conditions. Fifth, participants were asked to choose between four different burgers from a digital burger menu (Fig.6), within the fictitious context of a best friend taking the participant out for dinner at a burger restaurant named "Ultimate Burgers". Sixth, questions were asked about behavioral intention, personal norm, attitude towards lowering meat consumption, and the perceived norms (manipulation check). Seventh, participants were asked about their meat intake. Finally, participants were thanked for their participation in the experiment. Both the conditions (Fig. 3, Fig. 4, Fig. 5) and the digital burger menu (Fig. 6) used in the experiment, were designed through Adobe Photoshop.



Figure 6. Digital burger menu

3.4 Sample characteristics

A total of 298 individuals participated in this study, with varying levels of education and age. Conditions were randomly distributed among the sample, with an aim at equal sample distribution. Every condition was exposed to at least N=60 participants, of which half were exposed to a positively framed message, and the other half to a negatively framed message. After excluding vegetarians, vegans and incomplete responses, N=281 participants remained, of which approximately 65% is female and 35% is male, and the mean age of N=281 is approximately 34 years old (Table 1).

Table 1

Condition			Gender			Age
Norm	Frame	Ν	Female	Male	Other	Mean ^a (SD)
No norm (control)	PF^*	38	23	15	0	32.74 (12.56)
No norm (control)	NF^*	38	25	12	1	34.13 (13.00)
Injunctive norm	PF^*	35	27	8	0	35.55 (13.26)
Injunctive norm	NF^*	31	17	14	0	35.91 (15.15)
Descriptive norm	PF^*	37	26	11	0	33.65 (12.19)
Descriptive norm	NF^*	37	23	14	0	32.62 (14.14)
Combined norms	PF^*	33	19	14	0	33.28 (14.73)
Combined norms	NF^*	32	22	10	0	33.52 (13.04)
Total		281	182	98	1	33.89 (13.39)

Summary statistics of the distribution of Sample N=281 per condition

a Measured in years

* *PF* = *Positive Frame, NF* = *Negative Frame*

3.4.1 Distribution of the sample

An ANOVA was performed for gender, age and level of education, to determine if there is a significant difference of the individual demographics on each condition.

Age: No main effects are found in age (F(7,273) = 0.323, p =0.943). There is no significant difference between the injunctive norm (F(7,273) =0.856, p = 0.356), the descriptive norm (F(7,273) = 0.694, p =0.405), or framing (F(7,273) = 0.001, p =0.978). Therefore, age will not be considered as a covariate. *Gender:* No main effects are found in gender (F(7,273) = 0.854, p =0.543). There is no significant

difference between the injunctive norm (F(7,273) = 0.043, p = 0.836), the descriptive norm (F(7,273) = 0.060, p = 0.806), or framing (F(7,273) = 0.141, p = 0.708. Therefore, gender will not be considered as a covariate.

Level of education: No main effects are found in level of education (F(7,273) = 1.707, p = 0.107). There is no significant difference between the injunctive norm (F(7,273) = 0.420, p = 0.517), the descriptive norm (F(7,273) = 2.007, p = 0.158), or framing (F(7,273) = 0.000, p = 0.985. Therefore, level of education will not be considered as a covariate.

3.5 Normalitly check of the sample

Regarding the normality of both independent and dependent variables, skewness and kurtosis show that the sample data are skewed and kurtotic for all 8 conditions, but it does not differ significantly from normality. In terms of skewness and kurtosis, the data are normally distributed. According to Shapirowilk, the conditions containing an injunctive norm in a negative frame, injunctive norm in a positive frame, descriptive norm in a negative frame, and combined norms in a negative frame, are indeed normally distributed; p > 0.05. H0 = *not rejected*. However, the conditions containing the control message in a negative frame, control message in a positive frame, control message in a positive frame, the descriptive norm in a positive frame, were not normally distributed; p<.05. H0 = *rejected*. Therefore, a Levene's test was conducted and it can be concluded that the variance among the different groups is equal enough, F(7,27) = 1.43, p=.19 (p > 0.05), to meet the equal variance assumption.

3.6 Measurements

3.6.1 Preliminary analysis of the constructs

A preliminary analysis was done to determine which scales would be used to measure the different constructs. To determine which scales were to be used in the experiment, all scales were tested on internal consistency through Cronbach's Alpha in a pre-test with n=15. The original scales found in literature (scale sources), varying between 6 and 30 items per construct were used in the pre-test. Additionally, items were translated forward and backward (all original scales were in English), to try and achieve a valid Dutch translation of these scales. Questions who significantly lowered the internal consistency below the desired outcome ($\alpha 0.70$; Cortina, 1993) were deleted, resulting in a minimum of 4 items, and a maximum of 6 items, per construct with $\alpha > 0.70$. In the next paragraph the outcome of the constructs that were used for the experiment will be elaborated on in more detail.

3.6.2 Constructs

Constructs measured before exposure conditions: The construct *motivation to comply to the norm* was measured by 6 items, through a modified scale of the Social Norm Espouser scale (Bizer, Magin,

Levine, 2014), including questions such as "There is a correct way to behave in every situation" and "I always do my best to follow society's rules". Both constructs (attitude towards animal welfare, attitude towards environment) were also measured through a 7-point likert scale (1= strongly disagree / 7=strongly agree) by 6 items per construct. *Attitude towards environment* was measured through a modified version of the Environmental Attitudes Inventory (Milfont & Duckitt, 2010), including questions such as "I'd prefer a wild and natural garden to a well groomed and ordered garden" and "It makes me sad to see natural forest cleared for agriculture". *Attitude towards animal welfare* was measured through a modified version of the Animal Attitude scale (Herzog, Betchart, Pittman, 1991). including questions such as "I think people who object to raising animals for meat are too sentimental" and "Continued research with animals will be necessary if we are ever to conquer diseases such as cancer, heart disease, and AIDS".

Constructs measured after exposure to conditions: The mediators (personal norm and attitude towards lowering meat consumption) were both measured by 4 items. *Personal norm* was measured through feelings of moral obligation, based on a scale of Schwartz (1977), including questions such as "I feel morally obliged to eat less meat, to contribute to a better environment" and "I feel morally obliged to eat less meat, since this is the right thing to do".

Attitude towards lowering meat consumption was measured by 4 items, inspired by the attitude scale from the Theory of Planned behavior (Ajzen & Fishbein, 1980), including questions such as "It's important to eat less meat" and "It's responsible to eat less meat".

The dependent variable *behavior choice* was measured through multiple choice: after seeing a digital burger menu, participants were asked to choose a burger from a digital menu, within a fictional context of being out for dinner with a friend who treats. The multiple choice included a veggie burger, a chicken burger, a beef burger and a bean burger (Fig. 6).

The dependent variable *behavioral intention* was measured by 4 items on a 7-point likert scale (1= strongly disagree / 7=strongly agree), based on a scale derived from the Theory of Planned Behavior (Ajzen & Fishbein, 1980) including questions such as "In the next month, it's my intention to eat less (or no) meat" and "In the next month, it's my intention to have at least one meatless day per week".

A manipulation check was done by measuring the *perceived injunctive norm* and the *perceives descriptive norm*. The *perceived injunctive norm* was measured through 4 items on a 7-point likert scale (1= strongly disagree / 7=strongly agree) including questions such as "Most Dutch people think that you should eat less meat" and "Most Dutch people think that you should eat less meat" and "Most Dutch people think that you should eat less meat to contribute to animal welfare". The *perceived descriptive norm* was also measured through 4 items on a 7-point likert scale (1= strongly disagree / 7=strongly agree) including questions such as "Most Dutch people eat less meat" and "Most Dutch people eat less meat to contribute to animal welfare". All questions measuring the perceived norms, are in line with the desired norm and not the actual norm ("Most Dutch people eat meat on a daily basis").

3.6.3 Reliability of the constructs

Cronbach's alpha was tested again after collecting the full sample size of N=281. Some constructs did initially not meet the threshold of α 0.70 (Cortina,1993), but did meet the threshold when an item was deleted. Therefore, items that lowered internal consistency were removed (where possible) to heighten alpha scores. The construct *attitude towards environment* did not meet the threshold of 0.70 (Table 2), but since it was very close to the threshold, it was not excluded from the analysis.

ms Mean	sd *	а	
4.36	1.41	.71	
1 22	1 44	68	
4.22	1.44	.00	
3.78	1.56	.77	
5.13	1.50	.92	
4.19	1.80	.90	
3.92	1.95	.90	
4.07	1.62	.86	
4.06	1.47	.84	
	<i>ms Mean</i> 4.36 4.22 3.78 5.13 4.19 3.92 4.07 4.06	ms Mean sd* 4.36 1.41 4.22 1.44 3.78 1.56 5.13 1.50 4.19 1.80 3.92 1.95 4.07 1.62 4.06 1.47	msMean sd^* a4.361.41.714.221.44.683.781.56.775.131.50.924.191.80.903.921.95.904.071.62.864.061.47.84

Table 2

Descriptive statistics reliability of constructs measured with Cronbach's alpha

^a Measured on a 7-point likert scale (1=strongly disagree and 7 = strongly agree)

* Standard deviation

^{**} Manipulation check (also measured on a 7-point likert scale (1 = strongly disagree / 7 = strongly agree)

3.6.4 Validity of the constructs

To assess the validity of the constructs and all variables measured the underlying components as intended, a factor analysis was performed. The factor analysis showed that a total of eight underlying components were measured. One variable who originally belinged to the construct *attitude towards environment* (i.e. "Ik heb liever een tuin die wild en natuurlijk is, dan een goed verzorgde en geordende tuin"), was deleted since it had a low communality score reaching below the threshold of .4 (Stevens, 1992). After deleting this variable, a rotated component matrix was executed with all covariates, manipulation checks and the mediator, to identify if every construct was measured on the same components and if they would measure overlapping components (Appendix B).

Of the six variables that should measure the construct *motivation to comply to the norm*, one variable (i.e. "De standaard waaraan wij moeten voldoen binnen onze maatschappij, is te beperkend") measured a different underlying component and was the only variable measuring this component.

Therefore, this variable was left out of all further analysis, resulting in five variables that measure the construct *motivation to comply to the norm* (Appendix C).

The variables that should measure the construct *attitude towards environment*, were all measuring different underlying components of which two were cross loading (e.g. "het lijk mij leuk om lid te worden van een milieuorganisatie en hier actief aan mee te doen" and "Ik vind het erg leuk om tijd door te brengen in buitengebieden, zoals bijvoorbeeld in het bos"). This is probably due to the original scale existing of 20 variables, which was already downscaled immensely (to 6 variables) after the pre-test. Leaving out the variables that were either crossloading or measuring a different component from the factor analysis, three variables remained which is fairly low, since a minimum of four variables per construct is desirable (Raubenheimer, 2004). Considering the decrease of the original scale of twenty items to three items, and the different underlying components that were measured, the complete construct *attitude towards environment* was left out of all further analysis.

Of the four variables that should measure the construct *attitude towards lowering meat consumption*, three variables were cross loading, since they measured the same underlying component as *personal norm*. When observing the scales, there is great similarity found between the questions measuring *personal norm* and *attitude towards lowering meat consumption* (e.g. "I feel morally obliged to eat less meat, because this is the right thing to do" and "Consuming less meat is the right thing to do"), which is assumably the reason why they measure the same components. Additionally, since the *personal norm* scale is used and tested in multiple previous studies, and *attitude towards lowering meat consumption* is constructed for this study and inspired by, but not based on an existing scale, the construct *attitude towards lowering meat consumption* was left out of all further analysis.

The constructs *motivation to comply to the norm, attitude towards animal welfare, personal norm* and the manipulation check *perceived injunctive norm* and *perceived descriptive norm* were all measuring similar components while being distinct from each other, and were used in all further analysis (Appendix C).

4. Results

4.1 Manipulation check

To establish if the perceived injunctive and descriptive norms significantly differed between the control group and the group who was exposed to the norm conditions, a three way ANOVA was executed. Both *perceived injunctive norm*, and the *perceived descriptive norm*, were entered as dependent variables. No significant differences were found for *perceived injunctive norm* (F(7,273) = 1.133, p = 0.342) and *perceived descriptive norm* (F(7,273) = 0.722, p = 0.654) within the different conditions (Table 3).

Table 3

Descriptive statistics ANOVA manipulation check

Dependent variable	Condition type	F-value	df^{**}	Sig.
Perceived				
injunctive norm ^a				
	Injunctive norm	1.778	1	.183
	Descriptive norm	0.221	1	.639
	Framing	1.085	1	.298
	Injunctive norm * Framing	0.241	1	.621
	Descriptive norm * Framing	0.245	1	.624
	Descriptive norm * Injunctive norm	1.385	1	.240
	Descriptive norm * Injunctive norm * Framing	2.491	1	.116
Perceived				
descriptive norm ^a				
	Injunctive norm	2.247	1	.135
	Descriptive norm	1.206	1	.273
	Framing	0.653	1	.420
	Injunctive norm * Framing	0.073	1	.976
	Descriptive norm * Framing	0.001	1	.787
	Descriptive norm * Injunctive norm	0.177	1	.674
	Descriptive norm * Injunctive norm * Framing	0.772	1	.380
Perceived descriptive norm ^a	Descriptive norm * Framing Descriptive norm * Injunctive norm Descriptive norm * Injunctive norm * Framing Injunctive norm Framing Injunctive norm * Framing Descriptive norm * Framing Descriptive norm * Injunctive norm Descriptive norm * Injunctive norm	0.245 1.385 2.491 2.247 1.206 0.653 0.073 0.001 0.177 0.772	1 1 1 1 1 1 1 1 1 1 1	.624 .240 .116 .135 .273 .420 .976 .787 .674 .380

^a Measured on a 7-point likert scale (1=strongly disagree and 7 = strongly agree)

**degrees of freedom

From the findings above (Table 3) it can be concluded that the exposure to social norm messages did not influence the perceived social norm. Moreover, if the norm perception was influenced by being exposed to one of the norms, as opposed to not being exposed to a norm, outcome might have significantly differed within groups.

However, when looking at the descriptive statistics of both constructs, means are almost identical, and score in the middle of the scale (Table 4). This could imply that participantshad trouble estimating the actual norm, which is in line with the findings in literature.

General descriptive statistics manipulation check							
Manipulation	Ν	Mean	Median	sd*			
Perceived injunctive norm ^a	281	4.06	4.00	1.212			
Perceived descriptive norm ^a	281	4.07	4.25	1.359			

Table 4

^a Measured on a 7-point likert scale (1=strongly disagree and 7 = strongly agree)

* standard deviation

4.2 Main effects

4.2.1 Behavioral intention

A three-way ANOVA was performed with descriptive norm, injunctive norm and framing, as independent variables and behavioral intention as dependent variable and showed overall no main effects (F(7,273) = 1.433, p = 0.192) of the different conditions on behavioral intention. No main effects were significant between descriptive norm, (F(1,273) = 0.225, p = 0.636), injunctive norm (F(1,723) = 0.023, p = 0.879), and no significant effect for framing (F(1,723) = 0.050, p = 0.824).

Table 5

ANOVA of the different conditions with dependent variable behavioral intention

Condition	E-value	df^*	Sig
Condition	1 ⁻ vuiue	цj	Sig.
Descriptive norm	0.225	1	.636
Injunctive norm	0.023	1	.879
Framing	0.050	1	.824
Descriptive norm * Injunctive norm	1.565	1	.212
Descriptive norm * Framing	2.071	1	.151
Injunctive norm * Framing	0.011	1	.916
Descriptive norm * Injunctive norm * Framing	6.365	1	.012

* degrees of freedom

However, there was a significant three-way interaction effect found (Table 5), between descriptive norm, injunctive norm, and framing (F(1,723) = 6.365 p = 0.01) on behavioral intention.

Follow up analysis shows a significant interaction effect (F(3,134) = 3.242, p = 0.02; Table 6), when descriptive and injunctive norms are combined in a negative frame. The difference in outcome when a descriptive norm is not combined with an injunctive norm (Fig. 7), and when a descriptive norm is combined with an injunctive norm (F(1,134) = 8.70, p = 0.00; Fig. 8), indicates that a descriptive norm can have a negative effect on the mean outcome, when it is used in a negative frame and combined with an injunctive norm.

Table 6

Frame	Condition	F-value	df *	Sig.
Negative frame				
	Descriptive norm	2.064	1	.153
	Injunctive norm	0.001	1	.972
	Descriptive norm * Injunctive norm	8.029	1	.005
Positive frame				
	Descriptive norm	0.415	1	.520
	Injunctive norm	0.030	1	.863
	Descriptive norm * Injunctive norm	0.772	1	.397

ANOVA outcome between-subject effects behavioral intention

* degrees of freedom



Framing * Descriptive





Injunctive norm included



Figure 8. Cross interaction effect Framing * Descriptive * Injunctive norm

4.2.2 Behavior choice

Logistic regression was applied to explore the main effect between the different condition types, and behavior (choosing a burger from the menu). Two categories were distinguished: a meat category (coded as 0) that contained the chicken and beef burger, and a meatless category (coded as 1) that contained the veggie and bean burger. No significant main relationships were found between being exposed to the different conditions; descriptive norm (p = 0.46), injunctive norm (p = 0.94), framing (p = 0.80), and the outcome of choosing a meatless or meat option (Table 7).

Table 7

Conditions	b	SE b	Odds ratio	Sig*
Descriptive norm	.372	.51	1.450	.46
Injunctive norm	.038	.50	1.038	.94
Framing	.125	.50	1.133	.80
Descriptive * Framing	831	1.24	0.436	.27
Injunctive * Framing	907	1.42	0.404	.23
Descriptive * Injunctive	-1.016	.76	0.362	.18
Descriptive * Injunctive * Framing	2.328	1.11	10.262	.04
Constant	898	.36	0.407	.01

Logistic regression analysis of conditions on predicting behavioral outcome: burger choice

* Relation is significant at the 0.05 level

However, there was a significant three-way interaction effect found (Table 7), between the descriptive norm, injunctive norm and framing (p = 0.04). The outcome of the regression indicates, that participants who were subjected to the combined norms in a negative frame, were 10 times less likely to choose for a meatless burger option, as opposed to a positive frame.

4.3 Mediation analysis; personal norm

4.3.1 Behavioral intention

A mediation analysis was performed with framing, injunctive norm and descriptive norm as independent variables, *personal norm* as mediator, and *behavioral intention* as dependent variable (Fig.9). In relationship A and B, also the interaction of the independent variables were taken into account, these lines were not included to prevent unclarity of the model.



Fig. 9. Mediation analysis model with dependent variable behavioral intention

4.3.1.1 Three-way ANOVA; A¹, A², A³

In the previous paragraph (4.2.1), a three-way ANOVA was performed with descriptive norm, injunctive norm and framing, as independent variables and *behavioral intention* as dependent variable, which showed overall no main effects (F(7,273) = 1.433, p = 0.192) of the different conditions on behavioral intention. However, there was a significant three-way interaction effect found (Table 6), between descriptive norm, injunctive norm, and framing (F(1,723) = 6.365 p = 0.01) on behavioral intention.

4.3.1.2 Three-way ANOVA; B^1 , B^2 , B^3

A three-way ANOVA was performed with descriptive norm, injunctive norm and framing as independent variables, and *personal norm* as dependent variable. There were no significant differences (F(7,273) = 1.944, p = 0.06) between the conditions and *personal norm* (Table 7). Moreover, findings showed, no significant difference in means of personal norm in the groups: descriptive norm, (F(1,273) = 1.944, p = 0.06)

= 1.684, p = 0.64), injunctive norm (F(1,273) = 0.007, p = 0.83), and framing (F(1,273) = 1.208, p = 0.82).

Table 8

Condition type	<i>F-value</i>	df^*	Sig.
Descriptive norm	0.009	1	.926
Injunctive norm	0.010	1	.920
Framing	1.439	1	.231
Descriptive norm * Injunctive norm	1.141	1	.235
Descriptive norm * Framing	3.201	1	.210
Injunctive norm * Framing	1.579	1	.075
Descriptive norm * Injunctive norm * Framing	5.321	1	.012

ANOVA of the different conditions with dependent variable personal norm

* degrees of freedom

However, there was a significant three-way interaction effect found ($F(3.134) = 3.413 \ p = 0.02$), between the descriptive norm, injunctive norm, and framing on *personal norm* (Table 8). Follow up analysis (with two distinct groups of framing: positive and negative), showed a significant interaction effect (F(1.134) = 7.508, p = 0.00) in the negative frame when injunctive and descriptive norms were combined (Table 9).

Table 9ANOVA outcome between-subject effects personal norm

Frame	Condition	F-value	df^*	Sig.
Negative frame				
	Descriptive norm	0.994	1	.321
	Injunctive norm	1.947	1	.165
	Descriptive norm * Injunctive norm	7.508	1	.007
Positive frame				
	Descriptive norm	0.622	1	.432
	Injunctive norm	1.310	1	.254
	Descriptive norm * Injunctive norm	0.815	1	.368

* degrees of freedom

When the descriptive norm is excluded (Fig. 9), there seems to be little to no difference in outcome between a positively and a negatively framed message in combination with, or without (control message), an injunctive norm. However, when the descriptive norm is combined with an injunctive norm (Fig. 10), its outcome is significantly lower in a negative frame (F(1.134) = 7.508, p = 0.00; Table 9), as opposed to not being combined. In other words, when using a descriptive norm in a negative frame, it results in a positive effect on the mean outcome, while combining it with the injunctive norm, results in a negative outcome.



Figure 9. Cross interaction effect Framing * Injunctive



4.3.1.3 Simple linear regression; C

A simple linear regression was performed to see if there is a significant relation between *personal norm* and *behavioral intention*. A significant regression equation was found (F(1.279) = 355.110, p = 0.00) with an R² of .560. This means that 56 % of the variance in *behavioral intention* can be explained by *personal norm*.

4.3.1.4 Multiple regression with personal norm included

A multiple regression was performed with *behavioral intention* as a dependent variable, and framing, injunctive norm, descriptive norm and *personal norm* as independent variables. A significant regression equation was found (F(4.276) = 84.448, p = 0.00) with an R² of .565. However, only personal norm significantly adds to the prediction, p < 0.05 (Table 10).

Table 10

Multiple regression with dependent variable behavioral intention

Conditions	b	SE b	Sig [*]
Personal norm	.823	.04	.000
Descriptive norm	.050	.15	.734
Injunctive norm	120	.15	.416
Framing	.215	.15	.146
Constant	.376	.24	.112

* Relation is significant at the 0.05 level

4.3.1.5 Conclusion mediation analysis of personal norm

According to the results above, *personal norm* does mediate the relationship between the independent variables injunctive norm, descriptive norm and framing on the dependent variable *behavioral intention*. However, the mediating effect only seems present when when the injunctive and descriptive norms are combined, and used in a negative frame.

4.3.2 Behavior choice

A mediation analysis was performed with framing, injunctive norm and descriptive norm as independent variables, *personal norm* as mediator, and *behavior choice* as dependent variable (Fig.10). In relationship A and B, also the interaction of the independent variables were taken into account, these lines were not included to prevent unclarity of the model.



Fig. 10. Mediation analysis model with dependent variable behavior choice

4.3.2.1 Logisitc regression; A^1 , A^2 , A^3

In the previous paragraph (4.2.2), a logistic regression concluded that there were no significant main relationships found between being exposed to the different conditions; descriptive norm (p = 0.46), injunctive norm (p = 0.94), framing (p = 0.80), and the outcome of choosing a meatless or meat option. However, there was a significant three-way interaction effect found (Table 7), between the descriptive norm, injunctive norm and framing (p = 0.04).

4.3.2.2 Three-way ANOVA; B^1 , B^2 , B^3

In the previous paragraph (4.3.1.2) a three-way ANOVA was performed with descriptive norm, injunctive norm and framing as independent variables, and *personal norm* as dependent variable. There were no significant differences (F(7,273) = 1.944, p = 0.06) between the conditions (injunctive norm, descriptive norm and framing) and *personal norm* (Table 7). However, there was a significant three-way interaction effect found ($F(3.134) = 3.413 \ p = 0.02$), between the descriptive norm, injunctive norm, and framing on *personal norm* (Table 7).

4.3.2.3 Logistic regression; C

A logistic regression was applied to explore if there is a significant relation between *personal norm* and *behavior choice*. *Behavior choice* was divided into two categories: a meat category (which was coded as 0) and a meatless category (which was coded as 1). A significant relationship was found between *personal norm* (p = 0.00) and *behavior choice*.

4.3.2.4 Logistic regression including the moderator personal norm

Follow up analysis was done through a logistic regression with *personal norm*, descriptive norm, injunctive norm and framing as independent variables, and *behavior choice* as dependent variable. No significant main effect was found between descriptive norm (p = .94), injunctive norm (p = .84), framing (p = .90) and behavior choice, also no interaction effect was found (Table 11).

Table 11

Conditions	b	SE b	Odds ratio	Sig*
Descriptive norm	039	.54	0.962	.94
Injunctive norm	107	.54	0.899	.84
Framing	.068	.53	1.070	.90
Personal norm	.476	.10	1.610	.00
Descriptive * Framing	193	.80	0.825	.81
Injunctive * Framing	904	.80	0.405	.26
Descriptive * Injunctive	406	.80	0.666	.62
Descriptive * Injunctive * Framing	1.585	1.17	4.881	.18
Constant	-2.943	.60	0.407	.00

* Relation is significant at the 0.05 level

4.3.2.5 Conclusion mediation analysis behavior choice

According to the results above, *personal norm* does mediate the relationship between the independent variables injunctive norm, descriptive norm and framing on the dependent variable *behavior choice*. However, the mediating effect only seems present when when the injunctive and descriptive norms are combined, and used in a negative frame.

4.4 Moderation analysis; motivation to comply to the norm

A two-way ANOVA was performed, for descriptive norm and injunctive norm as independent variables, motivation to comply to the norm as moderator, and behavioral intention as dependent variable. Framing was left out of the equation, since it was expected that motivation to comply to the norm moderates the effectiveness of social norms, and therefore, not framing. Results show no significant outcomes (p > 0.05) when motivation to comply to the norm was added to the model.

A logistic regression was was performed with injunctive norm and descriptive norm as independent variables, *motivation to comply to the norm* as moderator, and *behavior choice* as dependent variable to see if there was a moderation effect. Framing was left out of the equation, since it is expected that *motivation to comply to the norm* moderates the effectiveness of norms, and therefore, not framing. No significant outcomes were found (p > 0.05) when *motivation to comply to the norm* was added to the regression in both independent variables.

4.5 Covariate analysis; attitude towards animal welfare

An ANCOVA was performed with *attitude towards animal welfare* as covariate, injunctive norm, descriptive norm and framing as independent variables, and *behavioral intention* as dependent variable. Results show no significant outcomes (p > 0.05).

A logistic regression was performed with *attitude towards animal welfare* as covariate, injunctive norm, descriptive norm and framing as independent variables, and *behavior choice* as dependent variable. Results show no significant outcomes (p > 0.05).

4.6 Additional analysis

4.6.1 Type of meat consumer

When analyzing the data, means were calculated for every independent variable, to reveal possible differences in means when a distinction was made in the amount of meat consumed per participant. Moreover, a participant who consumes meat on a daily basis, might have a different attitude towards animal welfare, and might feel less obligated to consume less meat (personal norm), compared to a participant who eats meat twice a week. Therefore, three groups of meat consumers were differentiated: a low meat intake group N= 120 (i.e. eats meat 1 to 2 days a week), a moderate meat intake group N= 99 (i.e. eats meat 3 to 4 days a week), and a high meat intake group N= 62 (i.e. eats meat 5 to 7 days a week).



Figure 11. Difference in means between type of meat consumers

A Kruskal-Wallis test shows that there is a significant difference between type of meat consumer, and *personal norm* ($X^2(2) = 44.845$, p = .00), and type of meat consumer and *attitude towards animal welfare* ($X^2(2) = 31.554$, p = .00). Interestingly, the group with high meat intake have stronger feelings of moral obligation (i.e. have a stronger personal norm against meat consumption) to lower their meat consumption than the low- or moderate meat intake group (Fig. 11). On the contrary, *attitude towards animal welfare* decreases among individuals who eat more meat (Fig. 11). It should be noted, that *personal norm* was measured after exposure to one of the conditions, while on the other hand *attitude towards animal welfare* was measured before exposure to the conditions. This could indicate that participants were influenced by being exposed to one of the conditions, which might have activated their personal norm (i.e. eating less meat is the right thing to do).

4.7 Hypothesis

Concluding from the results, the following hypothesis can be rejected and/or accepted:

Rejected:

Framing

- *H1a:* A *positively framed* message has no effect on lowering meat consumption, as opposed to a negatively framed message.
- *H1b:* A *negatively framed* message has a positive effect on lowering meat consumption, as opposed to a positively framed message.

Injunctive norms x Framing

- *H2a:* A positively framed *injunctive norm* message has a positive effect on lowering meat consumption, as opposed to an informative message.
- *H2b:* A negatively framed *injunctive norm* message has a positive effect on lowering meat consumption, as opposed to an informative message.

Descriptive norms x Framing

- *H3a:* A positively framed *descriptive norm* message has a positive effect on lowering meat consumption, as opposed to an informative message.
- *H3b:* A negatively framed *descriptive norm* messages has a positive effect on lowering meat consumption, as opposed to an informative message.

Descriptive norm x Injunctive norm x Framing

- *H4a:* A positively framed *combined norm* message has a positive effect on lowering meat consumption, as opposed to an informative message, and both norms separately used.
- *H4b:* A negatively framed *combined norm* message has a positive effect on lowering meat consumption, as opposed to an informative message, and both norms separately used.

Accepted:

Mediator

• *H5: Personal norm* mediates the relationship between the different message types and lowering meat consumption.

Rejected:

Covariates

- *H6a:* When the *attitude towards lowering meat consumption* is negative, all messages have no effect on lowering meat consumption.
- *H6b:* When the *attitude towards lowering meat consumption* is positive, all norm messages have a positive effect on lowering meat consumption, as opposed to the informative messages.
- *H7a:* When the *attitude towards environment is negative*, all messages have no effect on lowering meat consumption, as opposed to an informative message.
- *H7b:* When the *attitude towards environment is positive*, all norm messages have a positive effect on lowering meat consumption, as opposed to the informative messages.
- *H8a:* When the *attitude towards animal welfare is negative*, all messages have no effect on lowering meat consumption.
- *H8b:* When the *attitude towards animal welfare is positive*, all norm messages have a positive effect on lowering meat consumption, as opposed to the informative messages.

Rejected:

Moderator

• *H9: Motivation to comply to the norm* moderates the effectiveness of injunctive and descriptive norm messages on lowering meat consumption.

5. Discussion

5.1 Social norms

The main goal of this study was to determine whether injunctive and descriptive norms, either singular or combined, in a negative or positive frame, could influence behavior. The results show that there is no main effect of message types and framing on behavioral outcomes. However, there was a significant interaction effect found that is present in both dependent variables *behavioral intention* and *behavior choice*, as well in the mediating outcome. Moreover, the interaction effect shows that combining the injunctive and descriptive norm within a negative frame, can have a negative influence on the outcome (i.e. behavior choice and behavioral intention).

An explanation for this negative effect, could be because of guilt appeal. More specifically, when looking at the results, the condition (i.e. message) that was negatively framed and contained both social norms (e.g. stating that most people do eat less meat, and you should do so as well) might have been triggering extreme feelings of guilt, resulting in the negative response (Coulter, Cotte & Moore, 1999). In the context of this study, it could be argued that the combined norm message in the negative frame was the most extreme in terms of guilt appeal, compared to the other messages. Moreover, when looking at the content of the combined norm message in a positive frame, it stated clearly that you can make a difference by merely consuming 1 kg of less meat. While on the other hand, the negatively framed message only states what you single handedly cause by consuming 1 kg of meat, while on top of this, everyone thinks you should consume less meat and they are already consuming less meat. This is in line with the findings of Brennan & Binney (2010), who stated that guilt appeal can be motivating, but only when it is clear that individual action is needed and *can* make a difference. Additionally, when a consumer feels that the advertiser is using inappropriate tactics or they are trying to manipulate, they will have a negative reaction to the advertising (Coulter et. al., 1999). In conclusion, it could be that the high feelings of guilt that were evoked by the message, and perception of being manipulated, resulted in resistance. More specifically, in this study, it resulted in a negative outcome on the desired behavior.

5.2 Framing the message

Besides the injunctive and descriptive norms, the information that was displayed in the different conditions may have played a role in the results of this study as well. Moreover, the absence of a main effect could be explained by the perceived barriers that arise when people are confronted with reasons to lower meat consumption (Stea & Pickering, 2017; Zur & Klöckner, 2014; Hoek et. al., 2017), and Cognitive Dissonance Theory (Hoogland et. al., 2005; Hoek et. al., 2017). More specifically, people tend to feel uncomfortable when they are confronted with the negative effects of meat consumption on the environment and animal welfare, since they have high motivation to continue their meat eating habits (i.e. low motivation to lower their meat consumption), for reasons such as taste, and the high

social value of eating meat, to name a few (Macramid et. al., 2016; Stea & Pickering, 2017). Informing participants on the impact of meat consumption on animal welfare and the environment, was allegedly uncomfortable and in contrast to what they thought they knew, or wanted to believe. Because of this, awareness around the subject might be low (Hartmann & Siegrist, 2017; Hoek et. al., 2017; Macdiarmid et. al., 2016; Stea & Pickering, 2017), since people avoid learning about the topic, as it brings them in risk of cognitive dissonance. Nevertheless, the feelings of discomfort were not adequate to persuade participants into changing their behavior. This is in line with the results of a study of Hoogland et. al. (2005), who found that informing consumers on animal welfare might not be enough to persuade them into lowering their meat consumption, as they might avoid thinking about the negative impact when buying meat.

5.3 Moderators and mediators

This study found that, the higher the meat consumption among participants, the higher the feelings of moral obligation were to eat less meat. Interestingly, the more meat participants eat on a weekly basis, the more they feel morally obliged to decrease their meat consumption. This could be explained by the contrast between beliefs and behavior (e.g. eating high amounts of meat while believing it is best to eat less), as explained by Cognitive Dissonance Theory (Festinger, 1957). Even though there was no indication among high meat eaters that they intended to limit their meat intake, it could be that their feelings of guilt towards eating meat was higher, because their behavior was more in contrast with their beliefs (i.e. eating less meat is the right thing to do).

On the contrary, attitude towards animal welfare decreased, when meat intake increased. In other words, people with high meat intake, felt less concerned about animal welfare. However, attitude towards animal welfare was measured before the exposure to one of the conditions (i.e. messages), while personal norm was measured after the conditions. This could indicate that participants were influenced by seeing on of the conditions, which might have activated their personal norm (i.e. eating less meat is the right thing to do).

6. Limitations and recommendations

6.1 limitations

Although this study did have a considerable sample size (n = 281), with a minimum of n=30 per condition, distribution among male (35%) and female (65%) were not equal. Therefore, the sample of this study is not a perfect representation of the Dutch population. It is recommended, to strive for a more equal distribution in gender, to have a better representative sample for a population, so as generalizations of gender can be made.

Regarding the constructs, attitude towards environment had a reliability below threshold, and was found to measure different underlying factors. This is most likely due to the small sample size (N = 15) that is used in the pre-test. It is therefore recommended, to increase the chances of reliability and validity within constructs, by expanding the sample size of the pre-test.

Since this study is executed through an online questionnaire, responses are imperfect examples of real-world situations, and the validity of expressing feelings about hypothetical situations depend on how the contexts are interpreted by the different participants (Schwartz, 1977). Therefore, it is recommended, to do a similar experiment in a real-world setting, where behavior can be measured by observation. Unfortunately, for reasons of budget and time, this study could not make use of a real-world experiment.

6.2 Recommendations

Even though this study did not find any main effects, it did give implications for future research by exploring different barriers that can occur, and found a significant interaction effect between the combination of descriptive and injunctive norms when used in a negative frame. Therefore, caution is advised in future research when using a combination of both norms within a negative frame, since this appeared to have a negative effect within the context of this study.

Since participants with high meat intakte had higher feelings of moral obligation (i.e. personal norm) to consume less meat, it could imply that the step towards the actual behavior of lowering the consumption of meat might be too high, but the willingness is there. Moreover, it is advised to explore how to motivate individuals to lower their meat intake, while preventing cognitive dissonance. The question remains, if it is possible to motivate individuals to lower their meat consumption by merely exposing them to a message, or if it takes more than that to change consumers'eating habits.

Regarding future research in meat consumption and social norms in general, it is recommended to explore how cognitive dissonance can be prevented and what the role of guilt appeal does. Furthermore, informing individuals on the consequences of meat consumption (both positively and negatively framed) can trigger cognitive dissonance and feelings of guilt, that might overrule the effect of social norms.

7. Conclusion

Since the demand of meat is expected to grow in the future, which has a negative impact on our environment and animal welfare, effective methods of communication should be established to counter these negative effects. This study aimed to contribute to the establishment of these methods, by exploring the possible effects of social norms on behavior in the context of meat consumption.

Even though this study did not find any main effects, it did give implications for future research by exploring different barriers that can occur, and a significant interaction effect between the combination of descriptive and injunctive norms when used in a negative frame was found. Therefore, caution is advised in future research by using a combination of both norms within a negative frame, since this appeared to have a negative effect within the context of this study.

References

- Aiking, H. (2011). Future protein supply. *Trends in Food Science & Technology*, 22(2-3), 112-120. DOI: 10.1016/j.tifs.2010.04.005
- Aiking, H. (2014). Protein production: planet, profit, plus people?. *The American journal of clinical nutrition*, 100(suppl 1), 483S-489S. DOI: 10.3945/ajcn.113.071209
- 3. Ajzen, I. (2006). Constructing a theory of planned behavior survey.
- Allcott, H. (2011). Social norms and energy conservation. *Journal of public Economics*, 95(9-10), 1082-1095. DOI: 10.1016/j.jpubeco.2011.03.003
- 5. Bizer, G. Y., Magin, R. A., & Levine, M. R. (2014). The Social-Norm Espousal Scale. *Personality and individual differences*, 58, 106-111.
- Bastian, B., Loughnan, S., Haslam, N., & Radke, H. R. (2012). Do not mind meat? The denial of mind to animals used for human consumption. Personality and Social Psychology Bulletin, 38(2), 247-256. DOI: 10.1177/0146167211424291
- Borsari, B., & Carey, K. B. (2003). Descriptive and injunctive norms in college drinking: a meta-analytic integration. Journal of studies on alcohol, 64(3), 331-341. DOI: 10.15288/ jsa.2003.64.331
- 8. Brennan, L., & Binney, W. (2010). Fear, guilt, and shame appeals in social marketing. *Journal* of business Research, 63(2), 140-146.
- Burger, J. M., Bell, H., Harvey, K., Johnson, J., Stewart, C., Dorian, K., & Swedroe, M. (2010). Nutritious or delicious? The effect of descriptive norm information on food choice. Journal of Social and Clinical Psychology, 29(2), 228-242. DOI: 10.1521/jscp .2010.29.2.228
- Charles H, Godfray, J., Aveyard, P., Garnett, T., Hall, J. W., Key, T. J., Lorimer, J., ... & Jebb, S. A. (2018). Meat consumption, health, and the environment. *Science*, *361*(6399), eaam5324. DOI: 10.1126/science.aam5324
- 11. Cialdini, R. B. (2003). Crafting normative messages to protect the environment. Current directions in psychological science, 12(4), 105-109. DOI: 10.1111/1467-8721.01242
- Cialdini, R. B., Demaine, L. J., Sagarin, B. J., Barrett, D. W., Rhoads, K., & Winter, P. L. (2006). Managing social norms for persuasive impact. Social influence, 1(1), 3-15. DOI: 10.1080/15534510500181459
- Cialdini, R. B., Kallgren, C. A., & Reno, R. R. (1991). A focus theory of normative conduct: A theoretical refinement and reevaluation of the role of norms in human behavior. Advances in experimental social psychology (Vol. 24, pp. 201-234). Academic Press. DOI: 10.1016/S0065-2601(08)60330-5
- 14. Cortina, J. M. (1993). What is coefficient alpha? An examination of theory and applications. *Journal of applied psychology*, 78(1), 98.

- 15. Coulter, R. H., Cotte, J., & Moore, M. L. (1999). Believe it or not: Persuasion, manipulation and credibility of guilt appeals. *ACR North American Advances*.
- Daiton, M., & Zelley, E. D. (2011). Applying communication theory for professional life. Retrieved from http://books.google.com
- De Bakker, E., & Dagevos, H. (2012). Reducing meat consumption in today's consumer society: questioning the citizen-consumer gap. Journal of Agricultural and Environmental Ethics, 25(6), 877-894. DOI: 10.1007/s10806-011-9345-z
- De Boer, J., & Aiking, H. (2017). Pursuing a low meat diet to improve both health and sustainability: how can we use the frames that shape our meals?. *Ecological Economics*, 142, 238-248. DOI: 10.1016/j.ecolecon.2017.06.037
- De Kort, Y. A., McCalley, L. T., & Midden, C. J. (2008). Persuasive trash cans: Activation of littering norms by design. Environment and Behavior, 40(6), 870-891. DOI: 10.1177/0013916507311035
- Garnett, T. (2008). Cooking up a storm: Food, greenhouse gas emissions and our changing climate. Food Climate Research Network, Centre for Environmental Strategy, University of Surrey. Retrieved from https://www.fcrn.org .uk/fcrn/publications/cooking-up-a-storm
- Goldstein, N. J., Cialdini, R. B., & Griskevicius, V. (2008). A room with a viewpoint: Using social norms to motivate environmental conservation in hotels. Journal of consumer Research, 35(3), 472-482. DOI: 10.1086/586910
- 22. Graça, J., Calheiros, M. M., & Oliveira, A. (2015). Attached to meat? (Un) Willingness and intentions to adopt a more plant-based diet. Appetite, 95, 113-125. DOI: 10.1016/j.appet. 2015.06.024
- 23. Festinger, L. (1957). A theory of cognitive dissonance, Evanston, IL: Row & Peterson.
- Hartmann, C., & Siegrist, M. (2017). Consumer perception and behaviour regarding sustainable protein consumption: A systematic review. Trends in Food Science & Technology, 61, 11-25. DOI: 10.1016/j.tifs.2016.12.006
- 25. Herzog Jr, H. A., Betchart, N. S., & Pittman, R. B. (1991). Gender, sex role orientation, and attitudes toward animals. *Anthrozoös*, 4(3), 184-191.
- 26. Hoek, A. C., Pearson, D., James, S. W., Lawrence, M. A., & Friel, S. (2017). Shrinking the food-print: A qualitative study into consumer perceptions, experiences and attitudes towards healthy and environmentally friendly food behaviours. Appetite, 108, 117-131. DOI: 10.1016 /j.appet.2016.09.030
- 27. Hoogland, C. T., de Boer, J., & Boersema, J. J. (2005). Transparency of the meat chain in the light of food culture and history. Appetite, 45(1), 15-23. DOI: 10.1016/j.appet.2005.01.010
- 28. Joy, M. (2011). Why we love dogs, eat pigs, and wear cows: An introduction to carnism. Retrieved from http://books.google.com

- Keizer, K., Lindenberg, S., & Steg, L. (2008). The spreading of disorder. Science, 322(5908), 1681-1685. DOI: 10.1126/science.1161405
- Lally, P., Bartle, N., & Wardle, J. (2011). Social norms and diet in adolescents. Appetite, 57(3), 623-627. DOI: 10.1016/j.appet.2011.07.015
- Loughnan, S., Haslam, N., & Bastian, B. (2010). The role of meat consumption in the denial of moral status and mind to meat animals. Appetite, 55(1), 156-159. DOI: 10.1016/j.appet. 2010.05.043
- 32. Macdiarmid, J. I., Douglas, F., & Campbell, J. (2016). Eating like there's no tomorrow: Public awareness of the environmental impact of food and reluctance to eat less meat as part of a sustainable diet. Appetite, 96, 487-493. DOI: 10.1016/j.appet.2015.10.011
- Machovina, B., Feeley, K. J., & Ripple, W. J. (2015). Biodiversity conservation: The key is reducing meat consumption. *Science of the Total Environment*, 536, 419-431. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/26231772 DOI: 10.1016/j.scitotenv.2015.07.022
- 34. Melnyk, V., Herpen, E. V., Fischer, A. R., & van Trijp, H. C. (2011). To think or not to think: the effect of cognitive deliberation on the influence of injunctive versus descriptive social norms. Psychology Marketing, 28(7), 709-729. DOI: 10.1002/mar.20408
- 35. Milfont, T. L., & Duckitt, J. (2010). The environmental attitudes inventory: A valid and reliable measure to assess the structure of environmental attitudes. *Journal of environmental psychology*, *30*(1), 80-94.
- 36. Mollen, S., Rimal, R. N., Ruiter, R. A., & Kok, G. (2013). Healthy and unhealthy social norms and food selection. Findings from a field-experiment. Appetite, 65, 83-89. DOI: 10.1016/j.appet.2013.01.020
- Neighbors, C., Lee, C. M., Lewis, M. A., Fossos, N., & Larimer, M. E. (2007). Are social norms the best predictor of outcomes among heavy-drinking college students? Journal of studies on alcohol and drugs, 68(4), 556-565. DOI: 10.15288/jsad.2007.68.556
- Pedersen, E. R., Osilla, K. C., Miles, J. N., Tucker, J. S., Ewing, B. A., Shih, R. A., & D'Amico,
 E. J. (2017). The role of perceived injunctive alcohol norms in adolescent drinking behavior. Addictive behaviors, 67, 1-7. DOI: 10.1016/j.addbeh.2016.11.022
- Pohjolainen, P., Vinnari, M., & Jokinen, P. (2015). Consumers' perceived barriers to following a plant-based diet. British Food Journal, 117(3), 1150-1167. DOI: 10.1108/BFJ-09-2013-0252
- 40. Prunty, J., & Apple, K. J. (2013). Painfully aware: The effects of dissonance on attitudes toward factory farming. Anthrozoös, 26(2), 265-278. DOI:10.2752/1753037 13X13636846944367
- 41. Raubenheimer, J. (2004). An item selection procedure to maximize scale reliability and validity. *SA Journal of Industrial Psychology*, *30*(4), 59-64.

- Rimal, R. N., & Real, K. (2005). How behaviors are influenced by perceived norms: A test of the theory of normative social behavior. Communication research, 32(3), 389-414.
 DOI: 10.1177/0093650205275385
- 43. Rijksinstituut voor Volksgezondheid en Milieu (2016). Retrieved from https://www.wateet nederland.nl/resultaten/voedingsmiddelen/consumptie/vlees
- Robinson, E., Fleming, A., & Higgs, S. (2014). Prompting healthier eating: Testing the use of health and social norm based messages. Health Psychology, 33(9), 1057. DOI: 10.1037/ a0034213
- 45. Šedová, I., Slovák, Ľ., & Ježková, I. (2016). Coping with unpleasant knowledge: Meat eating among students of environmental studies. *Appetite*, *107*, 415-424.
- Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. Psychological science, 18(5), 429-434. DOI: 10.1111/j.1467-9280.2007.01917.x
- 47. Sentience Institute (2017, November, 20) Retrieved from www.sentienceins titute.org/press/animal-farming-attitudes-survey-2017
- Staunton, M., Louis, W. R., Smith, J. R., Terry, D. J., & McDonald, R. I. (2014). How negative descriptive norms for healthy eating undermine the effects of positive injunctive norms. Journal of Applied Social Psychology, 44(4), 319-330. DOI: 10.1111/jasp.12223
- 49. Stea S., & Pickering, G. J. (2017). Optimizing messaging to reduce red meat consumption. Environmental Communication, 1-16. DOI: 10.1080/17524032.2017.1412994
- Steinfeld, H., Gerber, P., Wassenaar, T. D., Castel, V., Rosales, M., Rosales, M., & de Haan, C. (2006). *Livestock's long shadow: environmental issues and options*. Food & Agriculture Org. Retrieved from http://www.europarl.europa.eu/climatechange/doc/FAO%20report %20executive%20summary.pdf
- 51. Stevens, J. P. (2012). Applied multivariate statistics for the social sciences. Routledge.
- 52. Sutton, C., & Dibb, S. (2013). Prime Cuts: valuing the meat we eat. World Wildlife Fund, Food Ethics Council: Godalming, UK. 1-46. Retrieved from http://assets.wwf.org.uk/ downloads/prime_cuts_food_report_feb2013.pdf
- Schwartz, S. H. (1977). Normative influences on altruism. In *Advances in experimental social* psychology (Vol. 10, pp. 221-279). Academic Press.
- 54. Thaler, H., Richard & Sunstein, R., Cass (2008). Nudge: Improving decisions about health, wealth, and happiness. Book, England, Penguin Books.
- 55. Tobler, C., Visschers, V. H., & Siegrist, M. (2011). Eating green. Consumers' willingness to adopt ecological food consumption behaviors. Appetite, 57(3), 674-682. DOI: 10.1016/j.appet.2011.08.010
- 56. Zur, I., & A. Klöckner, C. (2014). Individual motivations for limiting meat consumption. British Food Journal, 116(4), 629-642. DOI: 10.1108/BFJ-08-2012-0193

Appendix A

Qualtrics survey

UNIVERSITY OF TWENTE.

Welkom bij mijn afstudeeronderzoek!

Mijn naam is Amber Bruynzeel en voor mijn Master Communication Studies aan de Universiteit van Twente, doe ik onderzoek naar effectieve communicatie en sociale normen.

Het invullen van deze enquête duurt maximaal 10 minuten, is VOLLEDIG ANONIEM en je kunt op ieder moment–zonder opgaaf van redenen–je deelname aan dit onderzoek beëindigen.

Alvast heel erg bedankt!

UNIVERSITY OF TWENTE.

Eerst zou ik graag wat meer over je willen weten. Geen zorgen, het is allemaal anoniem!

Wat is je leeftijd? (graag in nummers antwoorden)

UNIVERSITY OF TWENTE.

Wat is je geslacht?

🔿 Man

O Vrouw

O Zeg ik liever niet

O Anders namelijk:

UNIVERS	TYDETWE	NTE.

Wat is je hoogst afgeronde opleiding?

- Geen opleiding/ onvolledig basisonderwijs
 Basis onderwijs
 VMBO
 HAVO/VWO
 MBO
- О нво
- O wo
- O PhD

O Anders

UNIVERSITY OF TWENTE.

Je hebt het eerste deel van de survey al ingevuld. Ga zo door!

De volgende stellingen gaan over de normen in Nederland.

Voorbeelden van normen zijn: bellen als je te laat bent voor een afspraak, achteraan een rij aansluiten en niet voorkruipen, of het opstaan voor een ouder persoon in de bus. Oftewel, ongeschreven regels die wij "normaal" vinden.

Geef aan in welke mate jij het eens bent met de volgende stellingen.

	zeer mee oneens	mee oneens	enigzins mee oneens	eens noch oneens	enigzins mee eens	mee eens	zeer mee eens
Onze maatschappij is gebouwd op ongeschreven regels, die mensen zouden moeten volgen.	0	0	0	0	0	0	0
De standaard waaraan wij moeten voldoen binnen onze maatschappij, is te beperkend.	0	0	0	0	0	0	0
Er is een "juiste" manier van gedrag in elke situatie.	0	0	0	0	0	0	0
Mensen die aan de verwachting van de maatschappij voldoen, zijn gelukkiger.	0	0	0	0	0	0	0
lk voel mij alleen op mijn gemak, als iedereen om mij heen voldoet aan de maatschappelijke norm.	0	0	0	0	0	0	0
lk doe altijd mijn best om de maatschappelijke norm te volgen.	0	0	0	0	0	0	0

De volgende stellingen gaan over het milieu.

Geef aan in welke mate jij het eens bent met de volgende stellingen.

	zeer mee oneens	mee oneens	enigzins mee oneens	eens noch oneens	enigzins mee eens	mee eens	zeer mee eens
Ik heb liever een tuin die wild en natuurlijk is, dan een goed verzorgde en geordende tuin.	0	0	0	0	0	0	0
Het maakt mij verdrietig om te zien dat natuurlijke bossen verdwijnen voor landbouw.	0	0	0	0	0	0	0
Het is belangrijker om het milieu te beschermen, dan banenbehoud.	0	0	0	0	0	0	0
Het lijkt mij leuk om lid te worden van een (activistische) milieu organisatie, en hier actief aan mee te doen.	0	0	0	0	0	0	0
Ik vind het erg leuk om tijd door te brengen in buitengebieden, zoals bijvoorbeeld in het bos.	0	0	0	0	0	0	0
lk probeer natuurlijke bronnen (zoals water) te besparen, zover mogelijk.	0	0	0	0	0	0	0

De volgende stellingen gaan over dieren.

Geef aan in welke mate jij het eens bent met de volgende stellingen.

	zeer mee oneens	mee oneens	enigzins mee oneens	eens noch oneens	enigzins mee eens	mee eens	zeer mee eens
Onderzoek op dieren is nodig als we ooit ziekten zoals kanker, hartziekten and AIDS willen overwinnen.	0	0	0	0	0	0	0
Mensen hebben in feite het recht, om dieren te gebruiken zoals zij geschikt achten.	0	0	0	0	0	0	0
Er is tegenwoordig teveel gedoe omtrent dierenwelzijn, terwijl er ook veel problemen omtrent mensen zijn die opgelost dienen te worden.	0	0	0	0	0	0	0
Het houden van grote aantallen vee op kleine oppervlakten is rechtvaardig, omdat hierdoor lagere prijzen voor vlees-, ei- en melk producten mogelijk zijn.	0	0	0	0	0	0	0
lk vind mensen die tegen het fokken van dieren voor vlees zijn, te sentimenteel.	0	0	0	0	0	0	0
Ik vind het acceptabel dat vee wordt gefokt voor menselijke consumptie.	0	0	0	0	0	0	0

Je krijgt nu een bericht met informatie te zien.

Neem de tijd om deze te lezen. Als je klaar bent, druk je op het pijltje onderaan de pagina om verder te gaan.

Participant is directed to one of 8 conditions

Je beste vriend(in) neemt je mee uit eten naar een nieuw burger restaurant bij jou in de buurt. Je krijgt de volgende menukaart te zien. Bekijk de menukaart om de vraag eronder te beantwoorden.



Welke burger heeft je voorkeur?

- O 1. Grilled veggie burger
- O 2. Fried chicken burger
- O 3. Grilled beef burger
- O 4. Grilled bean burger

Je bent al over de helft van de survey, ga zo door!

De volgende stellingen gaan over plichtsbesef.

Geef aan in welke mate jij het eens bent met de volgende stellingen.

	zeer mee oneens	mee oneens	enigzins mee oneens	eens noch oneens	enigzins mee eens	mee eens	zeer mee eens
Ik voel mij moreel verplicht om minder vlees te eten, omdat dit het juiste is.	0	0	0	0	0	0	0
Ik voel mij moreel verplicht om minder vlees te eten, om bij te dragen aan een beter milieu.	0	0	0	0	0	0	0
Ik voel mij moreel verplicht om minder vlees te eten, om bij te dragen aan het welzijn van dieren.	0	0	0	0	0	0	0
Ik voel mij moreel verplicht om tenminste één dag in de week geen vlees te eten.	0	0	0	0	0	0	0

De volgende stellingen gaan over jouw vlees consumptie in de aankomende maand.

In de aankomende maand...

	zeer mee oneens	mee oneens	enigzins mee oneens	eens noch oneens	enigzins mee eens	mee eens	zeer mee eens
is het mijn voornemen om tenminste één dag in de week geen vlees te eten.	0	0	0	0	0	0	0
is het mijn voornemen om meer dagen per week geen vlees te eten, dan wel vlees te eten.	0	0	0	0	0	0	0
is het mijn voornemen om meerdere dagen per week geen vlees te eten.	0	0	0	0	0	0	0
is het mijn voornemen om minder (of geen) vlees te eten in het algemeen.	0	0	0	0	0	0	0

De volgende stellingen gaan over wat jij denkt dat de norm is in Nederland, omtrent vlees eten.

De meeste Nedelanders vinden dat jij

	zeer mee oneens	mee oneens	enigzins mee oneens	eens noch oneens	enigzins mee eens	mee eens	zeer mee eens
tenminste één dag per week geen vlees zou moeten eten.	0	0	0	0	0	0	0
minder vlees moet eten, om bij te dragen aan een beter milieu.	0	0	0	0	0	0	0
meer dagen per week GEEN vlees zou moeten eten, dan dat je wel vlees eet.	0	0	0	0	0	0	0
minder vlees zou moeten eten, om bij te dragen aan dierenwelzijn.	0	0	0	0	0	0	0

De meeste Nedelanders....

	zeer mee oneens	mee oneens	enigzins mee oneens	eens noch oneens	enigzins mee eens	mee eens	zee mee eens
eten tenminste één dag per week geen vlees.	0	0	0	0	0	0	0
eten minder vlees om bij te dragen aan een beter milieu.	0	0	0	0	0	0	0
eten minder vlees in het algemeen.	0	0	0	0	0	0	0
eten minder vlees om bij te dragen aan dierenwelzijn.	0	0	0	0	0	0	0

De volgende stellingen gaan over jouw mening omtrent vlees eten in het algemeen.

Geef aan in welke mate jij het eens bent met de volgende stellingen.

	zeer mee oneens	mee oneens	enigzins mee oneens	eens noch oneens	enigzins mee eens	mee eens	zeer mee eens
Het is goed om minder vlees te eten.	0	0	0	0	0	0	0
Het is noodzakelijk om minder vlees te eten.	0	0	0	0	0	0	0
Het is belangrijk om minder vlees te eten.	0	0	0	0	0	0	0
Het is verantwoord om minder vlees te eten.	0	0	0	0	0	0	0

Bijna klaar, laatste 2 vragen!

Hoevaak at jij in de afgelopen maand (gemiddeld), vlees in de week?

- 🔿 dagelijks
- 6 dagen per week
- 5 dagen per week
- 4 dagen per week
- 3 dagen per week
- 2 dagen per week
- 1 dag per week
- O Ik eet geen vlees

Wil je kans maken op een Bol.com waardebon van €50?

Je emailadres zai ultsluitend gebruikt worden voor het kiezen van een winnaar van de waardebon. Geen email gegevens

worden opgeslagen, bewaard of anderzijds gebruikt.

O Ja ik wil kans maken, mijn emailadres is:

O Nee ik wil geen kans maken

Klik op het pijltje om de survey in te sturen en af te ronden!

Einde van de survey

Nogmaals hartelijk bedankt! Als je vragen of opmerkingen hebt, stuur mij dan gerust een email: a.b.bruijnzeel@student.utwente.nl

Heb je deze survey gevonden via surveyswap? https://surveyswap.io/sr/mUFtOBim9ejikJgn

Appendix B

Rotated Component Matrix

Rotated Component Matrix ^a									
_			Com	ponent					
	1	2	3	4	5	6	7	8	
De standaard waaraan wij									
moeten voldoen binnen onze						660			
maatschappij, is te						.009			
beperkend.									
Mensen die aan de									
verwachting van de				705					
maatschappij voldoen, zijn				.705					
gelukkiger.									
Onze maatschappij is									
gebouwd op ongeschreven				684					
regels, die mensen zouden				.064					
moeten volgen.									
Ik voel mij alleen op mijn									
gemak, als iedereen om mij				728					
heen voldoet aan de				./20					
maatschappelijke norm.									
Ik doe altijd mijn best om de									
maatschappelijke norm te				.781					
volgen.									
Ik vind het erg leuk om tijd									
door te brengen in						540			
buitengebieden, zoals						.549			
bijvoorbeeld in het bos.									
Het lijkt mij leuk om lid te									
worden van een									
(activistische) milieu			.479		574				
organisatie, en hier actief									
aan mee te doen.									
Ik heb liever een tuin die									
wild en natuurlijk is, dan een			583						
goed verzorgde en			.565						
geordende tuin.									
Ik probeer natuurlijke									
bronnen (zoals water) te			.613						
besparen, zover mogelijk.									

Het is belangrijker om het			
milieu te beschermen, dan		.730	
banenbehoud.			
Het maakt mij verdrietig om			
te zien dat natuurlijke bossen		.522	
verdwijnen voor landbouw.			
Ik vind mensen die tegen het			
fokken van dieren voor vlees	.587		
zijn, te sentimenteel.			
Ik vind het acceptabel dat			
vee wordt gefokt voor	.470		.539
menselijke consumptie.			
Mensen hebben in feite het			
recht, om dieren te	716		
gebruiken zoals zij geschikt	./10		
achten.			
Er is tegenwoordig teveel			
gedoe omtrent dierenwelzijn,			
terwijl er ook veel	500		
problemen omtrent mensen	.598		
zijn die opgelost dienen te			
worden.			
Onderzoek op dieren is			
nodig als we ooit ziekten	710		
zoals kanker, hartziekten and	./10		
AIDS willen overwinnen.			
Het houden van grote			
aantallen vee op kleine			
oppervlakten is rechtvaardig,			
omdat hierdoor lagere	.619		
prijzen voor vlees-, ei- en			
melk producten mogelijk			
zijn.			
Ik voel mij moreel verplicht			
om minder vlees te eten,	.787		
omdat dit het juiste is.			
Ik voel mij moreel verplicht			
om minder vlees te eten, om	812		
bij te dragen aan een beter	.012		
milieu.			

Ik voel mij moreel verplicht				
om minder vlees te eten, om	707			
bij te dragen aan het welzijn	.121			
van dieren.				
Ik voel mij moreel verplicht				
om tenminste één dag in de	.751			
week geen vlees te eten.				
Het is goed om minder vlees	800			
te eten.	.800			
Het is verantwoord om	715	407		
minder vlees te eten.	./15	.407		
Het is noodzakelijk om	945			
minder vlees te eten.	.845			
Het is belangrijk om minder	020			
vlees te eten.	.838			
De meeste Nederlanders			802	
vinden dat jij tenminste één				
dag per week geen vlees zou				
moeten eten.				
De meeste Nedelanders			.803	
vinden dat jij minder vlees				
moet eten, om bij te dragen				
aan een beter milieu.				
De meeste Nedelanders			.753	
vinden dat jij meer dagen per				
week GEEN vlees zou				
moeten eten, dan dat je wel				
vlees eet.				
De meeste Nedelanders			.737	
vinden dat jij minder vlees				
zou moeten eten, om bij te				
dragen aan dierenwelzijn.				
De meeste Nedelanders eten				.716
tenminste één dag per week				
geen vlees.				
De meeste Nedelanders eten				.791
minder vlees om bij te				
dragen aan een beter milieu.				
De meeste Nedelanders eten				.835
minder vlees in het				
algemeen.				

De meeste Nedelanders eten minder vlees om bij te dragen aan dierenwelzijn.

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 7 iterations.

Appendix C

	Variables	Component	Loading
lotivation to			
omply to the norm			
	- Mensen die aan de verwachting van de maatschappij voldoen zijn gelukkiger.*	1	.693
	- Onze maatschappij is gebouwd op ongeschreven regels.*	1	.689
	- Ik voel mij alleen op mijn gemak, als iedereen om mij heen voldoen aan de maatschappelijke	1	.691
	norm.*		
	- Ik doe altijd mijn best om de maatschappelijke norm te volgen. st	1	.783
	- Er is een "juiste" manier van gedrag in elke situatie.*	1	.535
ttitude toward			
nimal welfare			
	- Ik vind mensen die tegen het fokken van dieren voor vlees zijn, te sentimenteel. st	2	.647
	- Ik vind het acceptabel dat vee wordt gefokt voor menselijke consumptie st	2	.576
	- Mensen hebben in feite het recht, om dieren te gebruiken zoals zij geschikt achten.*	2	.669
	Pr is to any conditional gadas and that discovered the toppill as ack wal machiness and top	2	500
	- Er is tegenwooralg teveet gedoe omtrent aterenweizijn, terwijt er ook veet prootemen omtrent mensen sijn die ongelost dienen te worden *	2	
		2	200
	 Onderzoek op dieren is nodig als we ooit ziekten zoals kanker, hartziekten en AIDS willen 	2	.709
	overwinnen.	2	501
	- riet nouden van grote dantalien vee op meine oppervlanden is rechivaaraig, omdat nierdoor	2	.201
	ugere pryzen voor viees, ei en meik producien mogeryk zyn.		
Personal norm			
	- Ik voel mij moreel verplicht om minder vlees te eten, omdat dit het juiste is.*	3	.850
	. Ik voel mij moreel verplicht om minder vlees te eten, om bij te dragen aan een beter milieu.*	3	.769
	It was wii wawaal wawliakt aw window vlaar ta atau aw hii ta dwaran aan hat wal-iin wan	2	720
	- 1x voei mij moreei verpiicni om minuer viees te eten, om og te uragen aan net weizign van dieren *	3	.720
	- Ik voel mii moreel verplicht om tenminste één dag per week geen vlees te eten.*	3	.795
Perceived			
injunctive norm	De measte Medeulandeur vinden det iii terminste kén des neu week soon vleer son meater eter *	4	0 02
	- De meeste wederlanders vinden dat jij tenminste een dag per week geen viees zou moeten eten.	4	.802
	- De meeste Nederlanders vinden dat jij minder vlees moet eten om bij te dragen aan een beter	4	.803
	milieu.*		
	- De meeste Nederlanders vinden dat jij meer dagen per week geen vlees zou moeten eten dan	4	.753
	dat je wel vlees eet."		
	- De meeste Nederlanders vinden dat jij minder vlees moet eten om bij te dragen aan	4	.737
D	dierenwelzijn."		
Perceived			
decriptive norm	Da waarta Nadavlawdawr ataw tawwiwrta bâu dag war waak gaan vlaar *	5	716
	- De meeste treuer univers eten terminste een uug per week geen wees.	5	./10
	- De meeste Nederlanders eten minder vlees om bij te dragen aan een beter milieu st	5	.791
	- De meeste Nederlanders eten minder vlees in het algemeen.*	5	.835
	- De meeste Nederlanders eten minder vlees om bij te dragen aan dierenwelzijn."	5	.842

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.