Increasing Sustainable Behaviour through Intragroup Social Comparison: Can Meat Reduction Intentions be Influenced more Effectively when Intragroup Comparison is Tailored to Target Audiences?

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Abstract

When people are informed about sustainable behaviour from people in their ingroup, they are likely to conform. This study investigated if intragroup comparison of meat consumption is more effective in stimulating people's meat reduction intentions when it is tailored to their age and social dominance orientation (SDO). Younger people report mainly environmental and moral reasons for becoming vegetarian, as opposed to older people who report health reasons. Also, a high SDO is a predictor of low environmentalism and high acceptance of animal exploitation, potentially making them more sensitive to health reasons than moral or environmental reasons for meat reduction. It was therefore hypothesized that people who are compared to ingroup members who provide a moral, environmental or health-related reason for their low meat consumption are more inclined to reduce their meat consumption, especially if the reason provided matches the most likely motivation of people similar to them in terms of age and SDO. Dutch adults between the age of 18 and 73 participated in this study (N = 185). This experiment used a between-subjects design in which participants were divided randomly over four conditions (moral, environmental, health, or no reason) and were compared to ingroup members through a small story addressing the ingroups' low meat consumption after which their meat reduction intentions were measured. Our findings do not support the hypotheses. Potential explanations for this are explored in the discussion.

Keywords: sustainable behaviour, social influence, intragroup social comparison, meat reduction intentions, generations, SDO, ingroup identification

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The broader purpose of this study is to search for ways to stimulate people to eat less meat. More specifically, this study investigates if meat reduction intentions can be influenced more effectively when intragroup comparison is fine-tuned on specific target audiences. It is important to research new ways to influence people's meat consumption as there are several negative consequences connected to this. Due to global population growth and increasing average individual incomes, global meat consumption is rising (Godfray et al., 2018). In the Netherlands, meat consumption has even doubled compared to what it was in 1960 (PBL, 2013). When meat consumption is rising, livestock production increases and this may have major implications on our environment (Godfray et al., 2018). Agriculture is seen as the most contributing activity to climate change by human hand (Campbell et al., 2017), as it is a contributor to deforested land, pollution of greenhouse gasses and declining freshwater resources (Godfray et al., 2018). Besides effects on the environment, meat consumption may also have adverse effects on our health. Possible health impacts due to high intakes of processed meat or red meat are colorectal cancer, stomach cancer and cardiovascular disease (Godfray et al., 2018). Finally, meat consumption leads to animal suffering (Bastian & Loughnan, 2017). Harming others deliberately, especially when these others are weaker, often evokes emotions like anger, disgust, and contempt (Haidt, Koller & Dias, 1993). These emotions result in the majority of meat-eaters to find meat consumption emotionally disturbing and offensive, which may in some cases even be a reason to change their diet (Bastian & Loughnan, 2017).

About two percent of the Dutch population follows a vegetarian diet and this number has slowly been growing in the last few years. Meat consumption in the Netherlands has stagnated a little bit, but it has not been enough to decrease national meat consumption (Nederlandse Vegetariërsbond, 2020; RIVM, 2020). Though people may think eating meat is neither moral nor environmentally friendly nor healthy, most people still eat meat. The dissonance that occurs in this paradox exists because there are not only negative consequences, but also some perceived advantages regarding meat consumption (Bastian & Loughnan, 2017). In the past, early humans were dependent on seasons. During seasons where fresh fruits and leaves were not accessible, hunting naturally obtained a bigger role (Milton, 1999). Eating meat was and is calorie-efficient

as it has for example ten times more calories than broccoli. Human culture and the economy are based on meat consumption and producing meat is time-efficient. Humans eat meat out of habit and do not feel responsible. Additionally, people also just love the taste of meat (Bastian & Loughnan, 2017; Zur & Klöckner). Zur & Klöckner (2014) found that habit is the biggest predictor of meat consumption. However, this can be overruled by reduction intentions. These reduction intentions are predicted by attitudes and beliefs. Beliefs and attitudes regarding climate change, health outcomes and morality are the three main reasons for people to change their omnivore diet into a vegetarian one (Pribis, Pencak & Grajales, 2010). Also Zur and Klöckner (2014) have found that moral aspects and health aspects as well as other attitudes motivate the reduction of meat consumption. Since influencing meat reduction intentions is the broader purpose of this study, these different beliefs and attitudes have to be taken into account.

Intragroup Social Comparison

Decreasing meat reduction intentions amongst meat-eaters is important as meat consumption has several negative consequences. To do so, new ways of using intragroup comparison in the context of meat consumption will be investigated. The ingoup is everyone who belongs to an individuals' group. Simon (1992) described the ingroup as people who are ME, and the outgroup as people who are NOT-ME.

Intragroup comparison has been successful in the past when influencing people to behave more sustainably; when an individual receives information about an ingroup member who behaves more sustainably than they do, they are likely to alter their behaviour to become more sustainable themselves (Ferguson, Branscombe & Reynolds, 2011). Two prior studies (Goldstein, Griskevicius & Cialdini, 2007; Nolan et al., 2008) have had significant results when applying intragroup comparison. When Goldstein and colleagues (2007) provided the information that most previous guests in the same hotel room reused their towels, these individuals were more likely to reuse their towels as well. Also, Nolan et al. (2008) influenced individuals with intragroup comparison. They decreased their energy consumption because their energy use was being compared to the lower energy use of their neighbours.

The level of identification for the group can influence the extent to which people behave differently when observing their ingroup (Cialdini & Goldstein, 2009). Therefore it is a prerequisite for the intragroup comparison to work. A high identification level with an ingroup is associated with a high tendency to self-categorize as an ingroup member (Hall & Crisp, 2008). A

social identity (knowing that you belong in a certain group and having a value attached to that belonging) is heavily intertwined with linking personal identity to group identity (Abrams & Hogg, 2006). On top of that, behavioural outcomes can be predicted by the level of reference group norms for those who see group membership as a basis for their self-representation (Cialdini & Goldstein, 2009). For example, Terry & Hogg (1996) have found that the perceived health norms of the ingroup was a significant predictor of participants' intentions to behave healthy. This reference group consisted of peers and friends; people who had a high identification with each other. The ingroup that participants will be compared with in the present study is represented by people with similar demographic variables. They will have the same age, gender and education level. Also, they will be presented as they have participated in a pre-study from the same researcher. Furthermore the ingroup of each participant will be labeled as 'group A' to further emphasize the feeling of a real group.

Reasons

In this experiment, intragroup comparison will be used in the context of meat consumption. It will be investigated if meat reduction intentions can be influenced more effectively when intragroup comparison is fine-tuned on specific target audiences. The fine-tuning is done by ingroup members providing a specific reason (health, environmental, moral or no reason) for their low meat consumption and with that hopefully trigger certain target audiences to heighten their meat reduction intentions. Zur and Klöckner (2014) argued that because of different people having different reasons to reduce meat consumption, campaigns aimed at reducing meat consumption should use different motivations to persuade different individuals. For example, people who are from a younger age cohort report mainly environmental and moral reasons for becoming vegetarian, as opposed to people from an older age cohort who report health reasons (Pribis et al., 2010). On top of that, a high social dominance orientation (SDO) predicts low-environmentalism and higher acceptance of animal exploitation (Dhont & Hodson, 2014; Milfont et al., 2018). Age and SDO will thus be measured to study if individuals with different types of characteristics are more prone to the different specific reasons in each condition.

But first, it will be investigated if meat reduction intentions can be influenced more effectively when intragroup comparison is specified with providing reasons. It is hypothesized that a comparison with ingroup members that have a specific reason for their behaviour (Moral, Environmental or Health) may influence individual meat consumption even more than the

ingroup members providing no reason. Zur and Klöckner (2014) already argued the importance of emphasizing different motivations behind campaigns. Also, Cialdini (2009) explained that humans will be less likely to comply to a behaviour when they have not been given a reason to perform that behaviour. In other words, an automatic response like complying will follow on certain trigger features. Trigger features like a simple reason is needed for humans, otherwise the action will likely not occur. For example, Langer, Bank & Chanowitz (1978) found in their study that their participants pardon others more often for skipping the line at the copy machine when they provided a reason. This occurred even when the reason was not applicable to the situation and therefore made no sense. Merely saying the word 'because' was usually enough to get pardoned. When asking for a favour, people are more likely to comply when there is a reason or motivation provided.

H1: People who have been compared to ingroup members who provided a reason for their low meat consumption will have higher meat reduction intentions than people who have been compared to ingroup members who provided no reason for their low meat consumption.

Age. Generational research on meat consumption found that individuals who are classified in a middle aged group (41-60) seem to become vegetarian mostly because of health reasons. The younger generation, individuals under 20, seem to choose a vegetarian lifestyle because of environmental and moral reasons. This is not surprising as young people do not see health as much of a priority as old people do (Pribis et al., 2010). When people within one age cohort have different reasons for becoming vegetarian than people within other age cohorts, these people within this specific age cohort will probably be persuaded more with these specific reasons than with reasons that other age cohorts seem to think are more important. Therefore, people who are older will probably be more likely to heighten their meat reduction intentions mainly because of health reasons instead of environmental or moral reasons.

H2: Meat reduction intentions will be higher if the reason provided by the ingroup when using intragroup comparison matches the most likely motivation of people similar to them in terms of age cohort.

- *If people within the older age category are provided health related reasons, they are more inclined to have higher meat reduction intentions than if they would have been provided environmental or moral related reasons.*

- *If people within the younger age category are provided environmental or moral related reasons, they are more inclined to have higher meat reduction intentions than if they would have been provided health related reasons.*

Social dominance orientation. Similar to age, it is hypothesized that each of these reasons will most likely have a different effect on the individuals' meat consumption depending on their SDO. social dominance orientation (SDO) is a good predictor of group-relevant political and social attitudes. It measures whether an individual has a preference for inequality between social groups and to what degree this preference exists. Although SDO is a good predictor for group-relevant political attitudes, there is no need for political expertise when measuring it as it is an attitudinal orientation (Pratto, Sidanius, Stallworth & Malle, 1994). That is why it is a highly used questionnaire to objectively measure political attitudes. A high SDO has for example been associated with social and political ideologies that support hierarchy and implications between social groups such as racism and war (Pratto et al., 1994). Furthermore, SDO is not only used to describe human ideologies towards social groups, it also predicts the perception of the relationship between humans and animals. A high SDO is associated with a hierarchic belief of human superiority above nature and animals and low environmentalism. People with a high SDO perceive vegetarianism as a perceived threat to the dominant meat-eating way of life, and they are less likely to act on environmental issues (Dhont & Hodson, 2014; Milfont et al., 2018). A high SDO predicted a higher acceptance of meat consumption and animal exploitation (Dhont & Hodson, 2014). Following this information for the present research, people who score high on SDO will probably be more inclined to report high meat reduction intentions mainly because of health reasons, not because of environmental or moral reasons.

H2: Meat reduction intentions will be higher if the reason provided by the ingroup when using intragroup comparison matches the most likely motivation of people similar to them in terms of SDO.

- *If people with a high SDO are provided health related reasons, they are more inclined to have higher meat reduction intentions than if they would have been provided environmental or moral related reasons.*
- *If people with a low SDO are provided environmental or moral related reasons, they are more inclined to have higher meat reduction intentions than if they would have been provided health related reasons.*

In summary, the purpose of this study is to investigate if intragroup comparison of meat consumption is more effective in stimulating people's meat reduction intentions when it is tailored to their age cohort and SDO. This is very explorative, but that makes it innovative as well. It is hypothesized that people who are compared to ingroup members who provide a reason for their low meat consumption are more prone to reduce their meat consumption, especially if the reason provided (moral, health or environmental) matches the most likely motivation of people similar to them in terms of age cohort and SDO. People with a high SDO or people who are old would be most inclined to have higher meat reduction intentions when they are provided with health reasons. People with a low SDO or people who are young would be most inclined to have higher meat reduction intentions when they are provided with environmental or moral reasons. When this is proven, practical recommendations can be made for how intragroup comparison should be applied in practice for optimal results. For example, creators of interventions such as campaigns could then be advised to tailor their campaign to specific target audiences such as younger people by persuading them with specific reasons.

Method

Participants

This research needed participants of all ages, preferably distributed evenly between the younger (18-40 years) and the older (40+) generation. The online questionnaire has predominantly been distributed as a convenience sample on social media networks but a snowball effect has been implemented to obtain more participants from the older generation. Participants had to be 18 years or older and they could not contribute if they did not eat meat at least once a week, as the purpose of this study was to influence individuals who consumed meat regularly. Based on a power analysis, the recommended estimated sample size of this study was 181 participants. This was estimated because there are 9 predictors in this interaction model, while a significance level of 5 percent, a minimum R^2 of 0.10 and a power of 80 percent was used (Cohen, 1992; Hair, Hult, Ringle & Sarstedt, 2013).

281 participants have filled in the online survey between the 13th of May and the 25th of May 2020. Unfinished questionnaires (79 cases) were deleted from the dataset, as well as 16 cases who did not eat meat at least once a week, and one case who identified neither as man nor as woman. This person was deleted because he/she could not be compared with a gender that matched his/her own. Most people who did not finish the questionnaire did not even pass the long information letter. One extreme outlier was detected on SDO as this participant only selected maximum values on this Likert scale. This participant has not been removed from the dataset considering he/she might actually score that high, as the rest of the scores within other variables of the questionnaire still seemed credible and well distributed.

After checking all data, 185 usable cases remained (73 men, 112 women). The mean age of the participants was 32,7 years old (*SD* = 15.2), with the youngest person being 18 and the oldest 73 years old. The younger age category (18-40) consisted of 74,1% of the participants, whereas 25,9% belonged to the older age category (41-73). Most of the participants (69,7%) had a high education level (from HBO to a graduate diploma), 30,3% of the participants had a lower education level. 60% of the participants grew up in a rural area, but only 35,7% currently live in a rural area.

Design

This quantitative study has been conducted through an anonymous online experiment that used a between-subjects design where the participants were divided randomly over four conditions. In

either of these four conditions, participants were compared with ingroup members through a small story addressing the lower meat consumption of their ingroup members. The reason these ingroup members have for their low meat consumption varied between each condition; in the first three conditions the ingroup members have provided reasons (moral, environmental & health related reasons) and in the last condition there was no reason provided.

Procedure & Manipulation

The questionnaire has been realized and filled in by the participants with the help of the programme Qualtrics. Only a Dutch version of the questionnaire was available. An informed consent was offered to each participant. By accepting the informed consent, each participant gave permission to use their data. The informed consent was an information letter that consisted of a few components. Most importantly, it explained that filling in the survey was anonymous, safe and voluntary. Every participant who left their email address at the end of the questionnaire had a chance to win a gift card of 20 euros. Also, Bachelor students of Psychology could earn 0.25 PPU's by filling in this questionnaire.

After accepting the informed consent a few basic variables were measured. Variables such as age (open question), gender (Man, Woman, Other), residence of upbringing and current residence (Urban, Rural), level of education (No diploma, VMBO, HAVO, VWO, MBO, HBO, WO Undergraduate, WO Graduate) and current meat consumption were measured. Meat consumption was measured by a multiple choice question including the choices 'I do not eat meat weekly' and 'I eat meat in this many meals a week' with an open text entry added to the latter option so that people could fill in a number with a maximum of 21. If the participants chose the option 'I do not eat meat weekly', the survey ended. Also, when a person chose the option 'other' for gender, the survey ended, considering an obvious ingroup could not be created for them. Next, social dominance orientation (SDO) was measured.

After measuring these variables, intragroup social comparison started. An example of a story used in the questionnaire: "Before this study, a pre-study has been conducted by the same researcher. In this pre-study the goal was to obtain knowledge about how much meat people eat on average and their reasons and motivation behind their meat consumption. Based on your demographics you have been put in a group with other females who are around your age. This group (Group A.) represents people who are similar to you as they belong to the same age-cohort as you do (21-40 yrs old), they are the same gender (female) and have the same diploma's. The

participants who are in the same group as you are, eat on average only 75 percent of the meat that you do. This means that on average, you eat more meat. These women have stopped eating that much meat because of health reasons. They believe that people who don't eat meat live longer and are less sick."

The ingroup members in the stories were created on the spot, based on the demographic variables that participants filled in earlier. Participants were told that these ingroup members had the same gender (Man or Women), that they were within the same age cohort (<20, 21-40, 41-60 or >61), that they had the same diploma's and that they participated in a pre-study from the same researcher. In reality, no pre-study had been conducted. Finally, the ingroup members only ate meat 75% of the time than the participant did. This percentage was chosen because the meat consumption of ingroup members should be believable enough, but also still had to have an impact. Also, the current meat consumption was asked previously so showing this percentage should have been credible. With four different conditions, four different age cohorts and two different genders, 32 different stories have been created to present to the participants.

Each participant received either one of the four reasons randomly so that the sample size within each condition was evenly distributed. Only a brief description of each type of reason has been given to the participant as a detailed description could be interpreted very subjectively. Each of these brief descriptions have been derived from the study by Pribis and colleagues (2010) where attitudes were measured towards these descriptions to measure what reasons people predominantly had for becoming vegetarian in which age cohort. The brief description in the health condition was that the ingroup believed that people who eat less meat live longer and that they are less sick. In the environmental condition they believe that eating less meat is much more protective against the environment. In the moral condition they believe that it is wrong to kill animals. In the fourth condition no reason was provided for the meat consumption of the ingroup members.

After one of these four conditions was presented randomly, the participant's intention to eat less meat and the level of identification with the ingroup members was measured. The participant will not know the people of their assigned ingroup personally, so the question arises if they feel any level of identification with their ingroup. Finally, to measure if the manipulation was credible, participants were asked to give a score (1-7) of plausibility to report how much they thought the results of the pre-study were comparable to reality. For the manipulation to

work, it has to be plausible and the participants have to have some kind of identification with their ingroup.

Measurements

Dependent variable. To measure the dependent variable 'Meat reduction intentions' (See appendix A), the scale 'Willingness towards meat substitution' has been used (Graça, Calheiros & Oliveira, 2016). This scale has three items and a high reliability (α = .90). Participants were asked to score their willingness on a Likert-scale (1 = very unwilling, 5 = very willing) to reduce their meat consumption, to avoid eating meat and to follow a plant-based diet. Recoding was not necessary. This scale was translated with translation back-translation to Dutch (See appendix B). To measure the reliability of the scale after translation, the Cronbach's alpha was measured (α = .68). This digit could not be increased to at least .7 when removing one item from the scale. Although the Cronbach's alpha seems low, when running a factor analysis one factor was identified in this scale which accounted for 61.317 percent of the variance.

Moderators. This analysis has two possible moderators: age cohort and social dominance orientation (SDO). 'SDO' (See appendix A) was measured by using the SDO-scale originally by Pretto, Sidanus, Stallworth & Malle (1994). This scale has fourteen items and a high reliability (α = .83). 'Some people are just more deserving than others' is an example of an item in this scale. An already existing Dutch translation by van Hiel & Duriez (2002) has been used in this survey (See appendix B). This translation has a high reliability as well, ranging from α = .83 to α = .88 in three different samples. Because this Dutch version is a very formal scale with difficult words, some words were substituted by common synonyms to make the scale more accessible. 'Achtenswaardig' has been substituted by 'respect verdienend'. 'Moeten ijveren' has been substituted by 'moeite moeten doen'. The variable has been measured on a Likert scale with answers ranging from 1-5 (1 = strongly disagree, 5 = strongly agree). Items 8-14 needed recoding. The Cronbach's alpha (α = .85) was measured to determine if this scale still measures the same variable as it did before the adjustments and translations.

Control variable. 'The level of identification with ingroup' (See appendix A) has been measured with the 'ingroup identification' scale from Reid & Hogg (2005). This scale has a good reliability (α = .87). This scale is adjusted from the same-named scale that Hogg, Hains & Mason (1998) developed (α = .89). This variable has been measured with an 8-item scale (1= Not very much, 9 = Very much) and has been translated with translation back-translation to Dutch (See

appendix B). ‘How similar do you feel to group A?’ is an example of an item in this scale. The reliability of the scale (α = .92) maintained high in the present study.

Analysis

The analyses of this research have been executed with the help of the programme SPSS. For hypothesis 1, a simple regression has been used. For hypotheses 2 and 3 a hierarchical multiple regression has been used considering analyzing these hypotheses requires two moderators. All hypotheses have the same continuous outcome variable: ‘Meat reduction intentions’. Plausibility and identification with ingroup have been chosen as control variables for all hypotheses, because for the manipulation to work, participants need to find the manipulation plausible and have some sort of identification with their ingroup. For hypothesis 1, a dichotomous predictor reason/no reason has been computed as independent variable. The categorical independent variable ‘4 reasons’ needed for hypotheses 2 and 3, has four different conditions. In order to be able to use a categorical independent variable in a multiple regression these categories have been substituted by three dummies with ‘no reason’ as the constant zero. The moderator ‘age cohort’ is measured categorical as different age cohorts have different reasons for becoming vegetarian (Pribis et al., 2010). Moderator ‘SDO’ is continuous. Control variable ‘Identification with ingroup’ is continuous as well and is also added in the model as a possible moderating effect. Some people may agree with the reason given by their ingroup and some may not. To make sure that identification with the ingroup is not influenced by this and identification is the same in every condition, it is added as a control variable.

Results

Descriptive analysis

Descriptive statistics.

This study consisted of 185 cases. On average, the participants in this sample ate meat at least once a day. Their weekly meat consumption frequency varied from 1 – 21, with a maximum of three meals a day and mean of 7,39 times a week (*SD* = 4.58). The estimated plausibility that the meat consumption of the ingroup that was measured in the so-called pretest, matched the meat consumption of the same ingroup in reality, varied from 1-7 with a mean score of 3.91 (*SD* = 1.45). Identification with the ingroup answer options were 1-9 but mean scale results varied from 1-8. This variable had a mean of 4.34 (*SD* = 1.77). Meat reduction intentions after manipulation varied from 1-5, with a mean score of 2.99 (*SD* = .82). All means are situated around the center value (neutral) or just below the center value (slightly not agreeing) of the scale of each variable.

For a better understanding of significant mean differences between several groups within the sample, table 1 is presented. The younger age group reported a higher average social dominance orientation (SDO) (ΔM = -.239, p =.022) and a higher average identification with their ingroup (ΔM = -.640, p = .031). People with a high SDO (≥3) reported, on average, a higher current meat consumption (ΔM = 4.341, p < .001), lower meat reduction intentions (ΔM = -.674, p <.001) and a lower identification with their ingroup (ΔM = -.877, p = .023). People with a high SDO eat on average four meat-including meals per week more than people with a low SDO. Participants who currently live in urban areas are, on average, younger (ΔM = -9.257, p < .001) than participants living in rural areas. They also have, on average, a lower current meat consumption (ΔM = -2.127, p = .002), a lower SDO (ΔM = -.189, p = .048), and higher meat reduction intentions (ΔM = .297, p = .018) than participants living in rural areas. Men tend to have, on average, a higher meat consumption than women (ΔM = 3.498, p < .001), a higher SDO (ΔM = .404, p < .001) and lower meat reduction intentions (ΔM = -.435, p < .001). Men did not identify as well with their ingroup as women did (ΔM = -.620, p = .019).

Correlations. Table 2 shows the size and direction of the linear relationships between all continuous variables in the dataset. No notable strong relationships have been found ($r \geq 0.6$). However, some weak to moderate relationships are present. Some descriptive statistics have already been found in the independent t-test; people with a high SDO are more likely to consume

more meat, (r = .362, p < .001) they are more likely to have low meat reduction intentions (r = -.319, p < .001) and they are more likely to have a low identification with their ingroup (r = -.165, p = .025). Furthermore, age as a continuous variable has two very weak negative relationships with SDO (r = -.177, p = .016) and meat reduction intentions (r = -.148, p = .044). The older someone is, the more likely he/she is to have a low SDO and low meat reduction intentions. Next, participants who have low intentions in changing their current meat consumption, are more likely to have a high current meat consumption (r = -.394, p < .001) and they are more likely to have a low identification with the ingroup that they got presented (r = .164, p = .026). Finally, plausibility has two weak positive relationships with current meat consumption (r = .234, p = .001) and identification with ingroup (r = .241, p = .001). People who thought that the meat consumption of their ingroup measured in a pre-test matched reality, were more likely to have a high identification with that ingroup and were more likely to have a high current meat consumption. Information was given about the meat consumption of the ingroup, which was 75% of the consumption of the participant. It is quite logical that the more meat a participant consumes, the more this 75% seems credible.

Pearson's chi-square test of contingencies. A Pearson's chi-square test of contingencies was used to evaluate whether age cohort, level of education or gender were related to each other. With this test it can be investigated if the effect of age cohort on meat reduction intention is not in reality the effect of level of education or gender. Level of education was divided between low (no diploma - MBO) and high (HBO - WO) education. Only age cohort and education were significantly associated, $\chi^2(1, N = 185) = 4.07$, $p < .05$, but this association was quite small, $\varphi = .15$. More young people with a low education level were counted than expected. Similarly, more old people with a high education were counted than expected. This was probably the case because level of education was measured based on what diploma people possess, not what level of education they have yet to finish. As most young people have not yet finished their post high-school degree, they fall into the low education category.

Testing analysis

Hypothesis 1. It was hypothesized that providing a reason for low meat consumption by the ingroup members predicted higher meat reduction intentions. To test the linear relationship between the dichotomous variable reason/no reason and the outcome variable meat reduction intentions a regression has been used. Regression has been used in all analyses for comparative

purposes. Assumptions were evaluated to see if a regression analysis was a good fit to test hypothesis 1. Multicollinearity was not a problem as VIFs stayed <5. Residuals were normally distributed as the points clustered along the diagonal line in the p-plot of regression standardized residuals. Also, assumptions of normality, linearity and homoscedasticity have been met due to the even spread of points in the scatterplot of standardized predicted values.

In table 3, unstandardized coefficients (*B*), standard errors (*S.E.*) and standardized coefficients (β) have been presented for every step of the regression. In Model 1, only the control variables identification with ingroup and plausibility have been tested. Model 2 shows the results of also including the independent variable reason/ no reason. Model 1 shows that the control variables accounted for 4,3% of the variance in reduction intentions, $R^2 = .043$, $F(2, 182) = 4.08$, $p < .05$. Identification is the only significant predictor; people who have a high identification with their ingroup, have higher meat reduction intentions after the manipulation, $B = .091$, $\beta = .195$, $S.E. = .035$, $p < .05$.

In Model 2, the independent variable reason/no reason has been added into the regression. This accounted for a non-significant additional variance of 1%, $\Delta R^2 = .010$, $\Delta F(1, 181) = 1.85$, $p = .176$. Then, the control variables and independent variable together significantly explained 5,3% of the variance in reduction intentions , $R^2 = .053$, adjusted $R^2 = .037$, $F(3, 181) = 3.34$, $p < .05$. The effect size of Model 2 is small ($f^2 = .056$). Contrary to the expectations of hypotheses 1, the independent variable reason/no reason added in Model 2 did not show a significant slope, $B = .118$, $\beta = .099$, $S.E. = .139$, $p = .176$. Having been provided a reason for the behaviour of the ingroup has not been a significant predictor of meat reduction intentions. However, identification with ingroup stayed a significant positive predictor of meat reduction intentions in Model 2, $B = .095$, $\beta = .204$, $S.E. = .035$, $p < .01$.

Hypothesis 2/3. To test if people from specific target audiences can be influenced more to reduce their meat consumption by providing specific reasons, a multiple regression analysis has been used. To be able to use this analysis assumptions had to be evaluated. After centering the continuous variables SDO, Meat reduction intentions and Identification, VIFs stayed <5. Multicollinearity was thus not a problem. Also, assumptions of normality, linearity and homoscedasticity have been met due to the even spread of points in the scatterplot of standardized predicted values. In table 4-1 and table 4-2, unstandardized coefficients (B), standard errors (S.E.) and standardized coefficients (β) have been presented for every step of the

hierarchical multiple regression. Age cohort, Current meat consumption, Plausibility, SDO, Identification and Level of education are displayed in model 1. Age cohort, SDO and Identification have been added as predictors considering they are also tested as moderators. Level of education as a dichotomous variable has been added as a control variable because this variable was significantly associated with the variable age cohort in Pearson's chi square test. The independent variable '4 reasons' has been transformed into three independent dummy variables and is added in model 2. In model 3, 4 and 5, the interaction variables are added.

Model 1 accounted for 22,3% of the variance in reduction intentions, R^2 = .22, F(6, 178) = 8.53, p < .001. SDO is a negative significant predictor for meat reduction intentions, B = -.291, β = -.220, *S.E.* = .097, p < .01, as well as current meat consumption, B = -.053, β = -.296, *S.E.* = .013, p < .01. Both these variables stayed significant predictors throughout every addition to the analysis. Neither age cohort, B = -.174, β = -.093, *S.E.* = .131, p = .185, nor level of education, B = -.199, β = -.111, *S.E.* = .120, p = .100, were significant in model 1. The non-significance of these slopes stayed throughout every addition as well.

In Model 2, the three independent dummy variables were added to the table. This accounted for a non-significant additional variance of 1,2%, ΔR^2 = .01, ΔF(3, 175) = .89, p = .446. Then, the control variables and independent variables together significantly explained 23,5% of the variance in reduction intentions , R^2 = .24, adjusted R^2 = .20, F(9, 175) = 6.98, p <.001. The effect size of model 2 is medium (f^2 = .31). The independent dummy variables did not show significant slopes, which means they are not predictors; Environmental reason, B = .204, β = .110, *S.E.* = .154, p = .188. Moral reason, B = .134, β = .069, *S.E.* = .159, p = .400. Health reason, B = .236, β = .124, *S.E.* = .156, p = .133.

The interaction effects between age cohort and the independent variables have been added in Model 3 to test if age cohort is a moderator. This accounted for a non-significant additional variance of 1.3%, ΔR^2 = .01, ΔF(3, 172) = .97, p = .411. The three models together significantly explained 24,8% of the variance in reduction intentions, R^2 = .24, adjusted R^2 = .20, F(12, 172) = 4.72, p <.001. The effect size of model 3 is medium (f^2 = .33). The interaction variables did not show significant slopes, which means age cohort is not a moderator; Environmental reason*Age cohort, B = .202, β = .065, *S.E.* = .352, p = .568. Moral reason*Age cohort, B = -.403, β = -.111, *S.E.* = .371, p = .279. Health reason*Age cohort, B = -.004, β = -.001, *S.E.* = .358, p = .992.

To test if SDO is a possible moderator, the interaction effects between SDO and the independent variables have been added in model 4. This accounted for a non-significant additional variance of 1,2%, $\Delta R^2 = .01$, $\Delta F(3, 169) = .89$, $p = .446$. Model 1 till 4 then significantly explained 25,9% of the variance in reduction intentions , $R^2 = .26$, adjusted $R^2 = .19$, $F(15, 169) = 3.95$, $p < .001$. This model has a large effect size ($f^2 = .35$) The interaction variables did not show any significant slopes; Environmental reason*SDO, $B = .256$, $\beta = .087$, $S.E. = .259$, $p = .325$. Moral reason*SDO, $B = .378$, $\beta = .133$, $S.E. = .250$, $p = .133$. Health reason*SDO, $B = .289$, $\beta = .111$, $S.E. = .241$, $p = .233$.

Finally, in the last model, when adding the control moderator Identification, a non-significant additional variance was added of 3%, $\Delta R^2 = .03$, $\Delta F(3, 166) = 2.36$, $p = .073$. The whole hierarchical multiple regression, model 1 till 5, then explained 29% of the variance in reduction intentions, $R^2 = .29$, adjusted $R^2 = .21$, $F(18, 166) = 3.76$, $p < .001$. Model 5 has a large effect size ($f^2 = .41$). The interaction variables did not show any significant slopes; Environmental reason*Identification, $B = .159$, $\beta = .182$, $S.E. = .085$, $p = .063$. Moral reason*Identification, $B = -.037$, $\beta = -.039$, $S.E. = .092$, $p = .690$. Health reason*Identification, $B = -.065$, $\beta = -.060$, $S.E. = .098$, $p = .507$. SDO, throughout every addition and also in model 5, stayed a negative significant predictor for meat reduction intentions, $B = -.503$, $\beta = -.380$, $S.E. = .163$, $p < .01$, as well as current meat consumption, $B = -.051$, $\beta = -.286$, $S.E. = .014$, $p < .01$.

Contrary to hypotheses 2 and 3, none of the independent variables or interaction variables in any of the models turned out to be significant predictors. SDO and current meat consumption stayed significant throughout every step of the hierarchical regression.

Tabel 1-1.

Descriptive statistics of all continuous variables (N = 185)

		Age					**SDO**				
		18 - 40 *(N = 137)*		41 - 73 *(N = 48)*			1 - 2,9 *(N = 161)*		3 - 5 *(N = 24)*		
	Range	*M*	*SD*	*M*	*SD*	*Mean difference*	*M*	*SD*	*M*	*SD*	*Mean difference*
Age	18-73	.	.	.	.		33.087	15.260	30.083	14.873	-3.004
Current meat consumption	1-21	7.204	4.434	7.917	4.989	.712	6.826	4.255	11.1657	4.984	4.341***
SDO	1-5	2.379	.615	2.140	.619	-.239*	.	.	.	.	.
Identification ingroup	1-9	4.507	1.730	3.867	1.818	-.640*	4.456	1.681	3.578	2.170	-.877*
Meat reduction intentions	1-5	3.041	.811	2.840	.851	-.201	3.077	.798	2.403	.768	-.674***
Plausibility	1-7	3.905	1.475	3.938	1.420	.032	3.857	1.444	4.291	1.517	.435

Independent t-test

*. Mean difference is significant at p<.05

**. Mean difference is significant at p<.01

***. Mean difference is significant at p<.001

Tabel 1-2.

Descriptive statistics of all continuous variables (N = 185)

		Current Residence					Gender				
		Urban (N = 119)		Rural (N = 66)			Women (N = 112)		Men (N =73)		
	Range	*M*	*SD*	*M*	*SD*	*Mean difference*	*M*	*SD*	*M*	*SD*	*Mean difference*
Age	18-73	29.395	12.437	38.652	17.823	-9.257***	30.964	13.579	35.356	17.166	4.392
Current meat consumption	1-21	6.630	4.320	8.758	4.753	-2.127**	6.009	3.504	9.507	5.215	3.498***
SDO	1-5	2.250	.599	2.438	.652	-.189*	2.158	.502	2.561	.710	.404***
Identification ingroup	1-9	4.507	1.657	4.042	1.935	.466	4.586	1.664	3.966	1.872	-.620*
Meat reduction intentions	1-5	3.095	.798	2.798	.841	.297*	3.161	.780	2.726	.825	-.435***
Plausibility	1-7	3.807	1.492	4.106	1.383	-.299	3.839	1.455	4.027	1.462	.188

Independent t-test

*. Mean difference is significant at p<.05

**. Mean difference is significant at p<.01

***. Mean difference is significant at p<.001

Table 2.
Correlation matrix of all continuous variables (N=185)

		1.	2.	3.	4.	5.
1.	Age					
2.	Current meat consumption	.107				
3.	SDO	-.177*	.362***			
4.	Identification ingroup	-.143	-.123	-.165*		
5.	Meat reduction intentions	-.148*	-.394***	-.319***	.164*	
6.	Plausibility	.043	.234**	.063	.241**	-.084

*. Correlation is significant when p<.05

**. Correlation is significant when p<.01

***. Correlation is significant when p<.001

Table 3

Unstandardized coefficients (B), standard errors (S.E.) and standardized coefficients (β) of variables hypothesis1

	M1			M2		
	B	S.E.	β	B	S.E.	β
Intercept	2.885**	.204		2.709**	.241	
Control variables						
Plausibility	-.074	.042	-.131	-.070	.042	-.124
ID	.091*	.035	.195	.095**	.035	.204
Intragroup comparison						
Reason = 1				.188	.139	.099

*. Effect is significant at alphalevel <.05

**. Effect is significant at alphalevel <.01

Table 4-1

Unstandardized coefficients (B), standard errors (S.E.) and standardized coefficients (β) of variables hypotheses 2/3

	M1			M2			M3		
	B	S.E.	β	B	S.E.	β	B	S.E.	β
Intercept	1.121**	.310		.899*	.343		.942**	.354	
Control variables									
Agecohort	-.174	.131	-.093	-.174	.131	-.093	-.153	.266	-.081
Level of education	-.199	.120	-.111	-.189	.121	-.106	-.184	.122	-.103
Current meat consumption	-.053**	.013	-.296	-.056**	.013	-.312	-.055**	.014	-.307
Plausibility	-.014	.040	-.024	-.009	.040	-.015	-.008	.040	-.013
SDO	-.291**	.097	-.220	-.266**	.098	-.201	-.277**	.099	-.209
ID	.042	.033	.091	.046	.033	.099	.037	.034	.081
Intragroup comparison									
Env. = 1				.204	.154	.110	.141	.181	.076
Moral = 1				.134	.159	.069	.223	.181	.115
Health = 1				.236	.156	.124	.231	.181	.122
Interaction 1									
Env * Agecohort							.202	.352	.065
Mor * Agecohort							-.403	.371	-.111
Health * Agecohort							-.004	.358	-.001
Interaction 2									
Env * SDO									
Mor * SDO									
Health * SDO									
Interaction 3									
Env * ID									
Mor * ID									
Health * ID									

*. Effect is significant bij een alphalevel <.05

**. Effect is significant bij alphalevel <.01

Table 4-2

Unstandardized coefficients (B), standard errors (S.E.) and standardized coefficients (β) of variables hypotheses 2/3

	M4			M5		
	B	S.E.	β	B	S.E.	β
Intercept	1.413**	.463		1.510**	.535	
Control variables						
Agecohort	-.204	.268	-.109	-.258	.273	-.137
Level of education	-.197	.122	-.110	-.154	.122	-.086
Current meat consumption	-.056**	.014	-.314	-.051**	.014	-.286
Plausibility	.001	.041	.002	.011	.041	.020
SDO	-.482**	.165	-.365	-.503**	.163	-.380
ID	.041	.034	.089	.011	.061	.024
Intragroup comparison						
Env. = 1	.118	.181	.064	.120	.182	.065
Moral = 1	.179	.183	.092	.175	.186	.090
Health = 1	.203	.183	.107	.192	.184	.101
Interaction 1						
Env * Agecohort	.257	.355	.083	.278	.357	.090
Mor * Agecohort	-.308	.375	-.085	-.377	.397	-.104
Health * Agecohort	.076	.365	.024	.053	.372	.016
Interaction 2						
Env * SDO	.256	.259	.087	.379	.261	.129
Mor * SDO	.378	.250	.133	.332	.253	.117
Health * SDO	.289	.241	.111	.221	.245	.085
Interaction 3						
Env * ID				.159	.085	.182
Mor * ID				-.037	.092	-.039
Health * ID				-.065	.098	-.060

*. Effect is significant bij een alphalevel <.05

**. Effect is significant bij alphalevel <.01

Discussion

The primary goal of this study was to find new ways to influence people to reduce their meat consumption. With this information we should be able to make new innovative recommendations for practical interventions. This study was very explorative as intragroup comparison including reasons to influence people in the context of meat consumption, has not been applied before.

As argued by Cialdini (2009) and proven by Langer and colleagues (1978), people will have less reason to comply with other people's behaviour when they have not been provided a reason to do so. The hypothesis that having been provided a reason for the low meat consumption of the ingroup is a significant predictor of meat reduction intentions was rejected. However, identification with ingroup stayed a significant positive predictor of meat reduction throughout both models.

It was also hypothesized that the three different reasons (moral, health & environmental) would have a different effect on individuals' meat reduction intentions depending on their age group and their SDO score. This was hypothesized following the information that different age cohorts claim to have different reasons for becoming vegetarian (Pribis et al., 2010). Also, a high SDO has been proven to be a predictor of low environmentalism and a predictor of higher acceptance of meat consumption and animal exploitation (Dhont & Hodson, 2014; Milfont et al., 2018; Pratto et al., 1994). Providing either one of the different reasons was not a significant predictor of meat reduction intentions. Also, no moderator was found for any of these effects. Only SDO and current meat consumption were both significant direct predictors for meat reduction intentions. Both of these predictors were measured before manipulation and stayed significant throughout every model of the regression.

Limitations and future research

Since all hypotheses are rejected in this study, it is assumed that providing a reason or using different reasons for different people when applying social comparison does not influence meat reduction intentions more. However, recommendations for future research can be made to build on the findings and limitations of this study.

Some descriptive results provided us with useful information for future research. First of all, it became apparent that people with a high SDO have a much higher current meat consumption (on average four more meals per week) and lower meat reduction intentions than people with a low SDO. If the goal is to elevate meat reduction intentions amongst meat-eaters,

the best target group for future research would be people with a high SDO. This also applies to men and people who live in rural areas.

The category no reason served as a control variable for the different reasons in the manipulation of this experiment to not only measure the differences between the effects of each reason but also to measure the effects of the reasons as a whole opposed to no reason. No control variable has been used to test if intragroup comparison was a good choice. Because it has been proven in the past that sustainable behaviour could be transferred through intragroup comparison, this was an assumption. Evaluating this choice afterwards, it is not clear whether intragroup comparison made a contribution to meat reduction intentions. Also, it is not clear if the direct effect of for example SDO on meat reduction intentions exists because of intragroup comparison as SDO is measured before manipulation. A recommendation for future research is thus to add a control group when using intragroup comparison where no story is provided and only reduction intentions are measured. One might even expand this and add outgroup social comparison as well as it is already proven that intergroup (between-group) comparison is useful to promote sustainable lifestyles (Ferguson et al., 2011). What are the differences between intragroup and intergroup social comparison as an effect on the relationship between SDO and meat reduction intentions and how do these results differ to when there is no comparison at all?

Next, one might question if the ingroup is perceived by the participant as an ingroup. Although the participants were of the same age, same gender, possessed the same diplomas and participated in a pre-study of the same researcher, they might not have seen this group as an ingroup due to slight differences. For example, the ‘ingroup’ was not part of the same study but part of a pre-study. Also, the ‘ingroup’ eating 25% less meat could already be a big enough number for some people to see the ‘ingroup’ as an outgroup as some people eat a lot of meat and have no intention to change this. Moreover, participants might not actually agree in the slightest with the provided reason which may lead to having an out-group feeling. Finally, the created ingroup was maybe not specific enough. An ingroup does not only consist of people from the same category, but they have a common understanding of what that group is and what it means to them (Tajfel et al., 1979). Also, Abrams & Hogg (2006) argued that identification with a group is not solely based on group attributes or just falling in a social category, it is a sense of belongingness. In previous research they used neighbours and other hotel guests (Goldstein et al., 2007; Nolan et al., 2008). One can imagine that these people are more physical and personal to participants than just people who have the same demographic variables. Identification with the

ingroup was measured to see if the participants felt this belongingness and to use it as a control variable in the analyses. The answer options for every question on this scale varied from 1-9 with a mean of 4.34 (*SD* = 1.77). Although there was a positive correlation between meat reduction intentions and identification this mean is not high. A more personal and physical ingroup is thus recommended in future research. Also, if there is a clear ingroup which does not need a lot of explaining, there might be more focus on the reasons.There was a big focus on convincing the designated ingroup as an ingroup. This may have been overshadowing the reasons that the ingroup provided in the story. This may have resulted in that there were no significant differences between the effects of the reasons, because the reasons were not prominent enough in the stories.

Finally, measuring the variable plausibility only regarded the plausibility of the percentage of the ingroups' meat consumption, not the reason that the ingroup provided. Plausibility had a mean score of 3.9 (*SD* = 1.45). Since plausibility had a range from 1-7, this is not high. They may have bought the percentage, but not that the ingroup mainly had that specific reason for their low meat consumerism. Considering this measurement does not include the reasons, this estimation of plausibility may even be lower in reality.

Conclusion

Unfortunately, no recommendations for practical interventions can be made, as every hypothesis is rejected. But the results indicate that people with a high SDO are a great target group to influence as they have a high current meat consumption. Also, a low SDO is already proven to be a significant predictor for meat reduction intentions. But before we can make recommendations about this, future research needs to investigate if this is a significant predictor because of intragroup comparison, if this effect would be there without comparison or if intergroup comparison may work even better.

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Appendix A: Original scales

SDO

Social dominance orientation (α = .83) (Pretto, Sidanius, Stallworth & Malle, 1994)

(1 = very negative, 7 = very positive).

1. Some groups of people are simply not the equals of others.
2. Some people are just more worthy than others.
3. This country would be better off if we cared less about how equal all people were.
4. Some people are just more deserving than others.
5. It is not a problem if some people have more of a chance in life than others
6. Some people are just inferior to others.
7. To get ahead in life, it is sometimes necessary to step on others.
8. Increased economic equality
9. Increased social equality
10. Equality
11. If people were treated more equally we would have fewer problems in this country.
12. In an ideal world, all nations would be equal.
13. We should try to treat one another as equals as much as possible. (All humans should be treated equally)
14. It is important that we treat other countries as equals.

Intention towards less meat consumption

Willingness towards meat substitution (α = .90) (Graça, Calheiros & Oliveira, 2016)

(1 = very unwilling, 5 = very willing)

What is your willingness to

1. Reduce meat consumption
2. Avoid eating meat
3. Follow a plant-based diet

Level of identification with ingroup

Ingroup identification (α = .87) (Reid & Hogg, 2005)

Based on Hogg, Hains & Mason (1998) (α = .89)

(1 = Not very much, 9 = Very much)

1. How much would you like to get to know the rest of group A?
2. How similar do you feel to group A?
3. To what extent do you feel a sense of belonging to the rest of group A?
4. How much do you identify with group A?
5. To what extent do you feel strong ties with group A?
6. How important is group A to you?
7. How much do you feel you might like the other members of group A?
8. How much do you feel like you would fit into group A?

Appendix B: Translated and altered scales

SDO

Dutch translation by van Hiel & Duriez (2002) (α = .83 to α = .88 in three different samples)

(1 = helemaal oneens , 5 = helemaal eens)

1. Sommige sociale groepen zijn eenvoudigweg niet de gelijke van andere groepen.
2. Sommige mensen verdienen meer respect dan anderen.
3. Indien men niet zoveel aandacht zou besteden aan de gelijkheid tussen de mensen, zou dit land er veel beter bij varen.
4. Sommige mensen zijn niet evenwaardig aan anderen.
5. Ik vind het normaal dat sommige mensen meer kansen in het leven krijgen dan anderen.
6. Sommige mensen zijn inferieur aan anderen.
7. Het is soms nodig om anderen in de weg te staan om vooruit te komen in het leven.
8. Men zou moeite moeten doen voor een grotere economische gelijkheid.
9. Men zou moeite moeten doen voor een toenemende sociale gelijkheid.
10. Gelijkheid is een belangrijke waarde voor mij.
11. Indien mensen op gelijke voet zouden behandeld worden, dan zouden er minder problemen zijn in deze maatschappij.
12. In een ideale wereld zouden alle naties op basis van gelijkwaardigheid behandeld worden.
13. We zouden elkaar zo veel mogelijk als gelijken moeten behandelen
14. Het is belangrijk dat wij andere landen als gelijken behandelen.

Intention towards less meat consumption

Translated with translation back-translation to Dutch.

(1 = helemaal niet bereid, 5 = helemaal bereid)

Geef aan in hoeverre u bereid bent om:

1. Uw vleesconsumptie te verminderen
2. Vlees eten te vermijden
3. Een plantaardig dieet te volgen

Level of identification with ingroup

Translated with translation back-translation to Dutch.

(1 = helemaal niet, 9 = heel veel)

1. Hoe graag zou je de rest van groep A willen leren kennen?
2. Hoe overeenkomstig voel je je met groep A?
3. In hoeverre heb je het gevoel dat je bij de rest van groep A behoort?
4. In hoeverre identificeer je je met groep A?
5. In hoeverre voel je een sterke band met groep A?
6. Hoe belangrijk is groep A voor jou?
7. In hoeverre denk je dat je de andere leden van groep A misschien leuk vindt?
8. In hoeverre denk je dat je in groep A zou passen?