The Effect of Norm Activation, Goal Frames and Food Neophobia on the Intention to Engage in Diet-related Pro-Environmental Behaviours

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Abstract

The current rate at which climate change is progressing, is affecting our future on this planet. In order to keep living comfortably on this earth, it is important to mitigate climate change. One of the most effective ways to mitigate climate change is to make more sustainable food choices. Both the norm activation model as well as the goal-framing theory are known to predict pro-environmental behaviour, but there is still uncertainty about which approach can best be taken when motivation diet-related pro-environmental behaviour. Additionally, food neophobia can be considered when exploring the intention to engage in less common diet-related pro-environmental behaviour, such as entomophagy (insect eating). In this study, the effect of the norm activation model and the goal-framing theory on the intention to engage in diet-related pro-environmental behaviour was explored. An online survey study (N = 104) was conducted with two experimental conditions, each describing different types of motivations to engage in diet-related pro-environmental behaviour. The expectation that people would be more motivated to engage in diet-related pro-environmental behaviours when exposed to multiple different motivations, as in line with the goal-framing theory, compared to when only moral motivations were emphasized, as proposed by the norm activation model, was not supported by the results. With this in mind, it can be useful to consider the norm activation model when motivating diet-related pro-environmental behaviour.

Keywords*: pro-environmental behaviour, goal framing theory, norm activation model, food neophobia, entomophagy.*

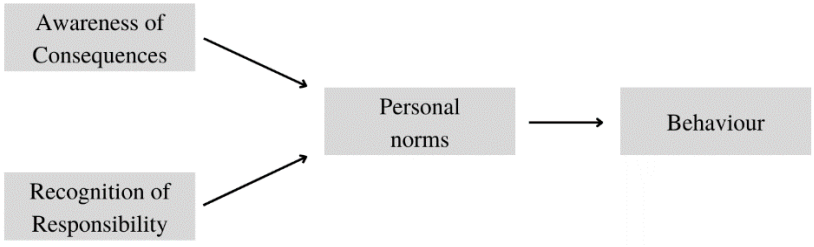
The Effect of Norm Activation, Goal Frames and Food Neophobia on the Intention to Engage in Diet-related Pro-Environmental Behaviours

The current rate at which climate change is progressing, is affecting our future on this planet. In order to keep living comfortably on this earth, it is important to adapt to climate change. However, simply adapting is not enough: it has been shown that it is of great importance that we also need to make attempts to mitigate climate change (IPCC, 2022). Human behaviour plays an important role in this challenge, which is why it is important to motivate the adoption of pro-environmental policies among governments and organisations, as well as pro-environmental behaviour (PEB) in individual consumers. However, not all PEB are equally effective and impactful. Therefore, it is useful to consider which PEB should be prioritised. As described by Ivanova et al. (2020), a promising opportunity to mitigate climate change is a dietary shift, which refers to motivating the consumption of sustainable foods and stimulating the idea of having plant-based food as the default choice. Krizanova et al. (2021) show that the adoption of a plant-based diet is predicted by the degree of engagement in other PEB. I argue however, that it is also important to explore how diet-related PEB can be motivated more directly. This is only possible if we know what drives diet-related behavioural change. In my study, I aimed to answer the following research question: 'which approach to motivating diet-related PEB is most effective?'. There are multiple approaches that can be taken when motivating behaviour, which will be discussed in the following sections. Two theoretical approaches to motivating PEB will be introduced, namely the norm activation model (NAM) and the goal-framing theory (GFT). Additionally, the possible influence of food neophobia on diet-related PEB will be explored, followed by an introduction of the design of the current study and the hypotheses that will be tested.

Norm activation model

Firstly, norms as a predictor of diet-related PEB will be discussed. Personal norms are known to influence behaviour (Ajzen, 1991; Bratt, 1999; De Groot et al., 2021; De Groot & Steg, 2009). A theoretical approach that considers personal norms as a predictor of pro-social behaviour is the norm activation model (NAM). A reason to look at PEB from the perspective of the NAM, is that PEB is considered as a form of pro-social behaviour (Steg & De Groot, 2010), which is especially relevant when motivating diet-related PEB from a normative perspective (Govaerts & Olsen, 2022; Han et al., 2016; Shin et al., 2018). As pictured in figure 1, the NAM states that pro-social behaviour is predicted by the awareness of the consequences, the recognition of responsibility and someone's personal norms (Schwartz, 1977; Shin et al., 2018). The awareness of consequences (AC) and the recognition of responsibility (RR) refer to the consequences of unsustainable behaviour. Thus, whether someone is aware of the consequences that follow in the case that they decide to not act pro-environmental and the degree to which they feel they are responsible for these consequences. As defined by Shin et al. (2018), personal norms are the degree to which someone feels obligated to 'do the right thing'.

Figure 1. Norm-activation model (Schwartz, 1977)



Firstly, when considering the role of AC and RR, it is important to note that Shin et al. (2018) have found that AC has a stronger influence on the strength of participants' intention to engage in PEB than RR (Shin et al., 2018). When considering how to motivate diet-related

PEB from the perspective of the NAM, it could therefore be useful to draw attention to the consequences of non-environmental behaviour, since AC has been shown to affect the intention to engage in PEB (De Groot & Steg, 2009; Han et al., 2016). Secondly, when considering personal norms as a predictive factor, the NAM views personal norms as a factor that is influenced by AC and RR. An alternative view on the role of personal norms is proposed by Stern et al. (1986), who state that personal norms are simply activated rather than influenced by AC and RR. This supports the idea that someone's personal norms, rather than being susceptible to being influenced, are pre-existent and possibly a stable factor predictive of PEB (Blamey, 1998). This gives way to the idea that someone's personal norms might influence the effect of influences on diet-related PEB rather than directly influence diet-related PEB. More specifically, instead of AC and RR motivating behavioural change through influencing someone's personal norms, the strength of someone's personal moral norms might influence the degree to which they are influenced in their intention to engage in PEB. The current study will attempt to assess to what degree the NAM has predictive value with regards to diet-related PEB, specifically focussing on the consequences of non-environmental behaviour and the moderating role of personal moral norms on this relation.

Goal frames

Another approach is the goal-framing theory (GFT), which states that people engage in certain behaviour because of the goals they prioritise. As described by Lindenberg and Steg (2007), the GFT considers three goal frames: normative-, hedonic- and gain goals. When viewing something from a normative goal frame, someone will engage in certain behaviours in order to 'do the right thing' (Schwartz & Howard, 1981). When considering a hedonic goal frame, someone will engage in behaviour that results in pleasure. Finally, the gain goal frame motivates behaviour that will result in the protection or acquisition of resources. When considering how to motivate PEB from different goal frames, Lindenberg and Steg (2007)

show that, even though PEB is seen as normative behaviour, it can also be motivated through hedonic- and gain goals.

Normative goals, which are associated with PEB, are typically focussed on benefits that affect a group larger than the individual, and have positive consequences on the long term (Lindenberg & Steg, 2007). Since PEB often requires higher costs and leads to lower levels of comfort (McKenzie-Mohr, 2000), engaging in this behaviour requires the individual to refrain from satisfying egoistic needs. This can cause conflict between the three goal frames. Therefore, in order to motivate PEB, it is recommend that hedonic- and gain-focussed incentives should specifically be offered as a supporting factor to normative motivations for engaging in a PEB (Lindenberg and Steg, 2007; Steglich, 2003). This can help to reduce the competition between the different goal frames. With this in mind, it can be relevant to explore the effect that the incorporation of different goal frames, and therefore different motivations, could have on the intention to engage in diet-related PEB.

Food neophobia

As mentioned before, a dietary shift to more sustainable foods can have great mitigating effects on climate change. However, motivating dietary shifts is likely to come with a variety of challenges. In this study, I will consider one of these challenges, namely the resistance to uncommon sustainable foods (Onwezen et al., 2022), and how food neophobia plays a role in this challenge. Before I explore this challenge, it is important to define sustainable foods. In the current study, the term ‘sustainable foods’ relates to foods with low environmental impact (Burlingame, 2012). Some examples of sustainable foods are plant-based products, locally produced foods, seasonal foods and unconventional foods that require little resources, such as insects and seaweed (Wageningen University & Research, 2022a; Wageningen University & Research, 2022b). Seaweed can be grown on the seabed, it does

not require any freshwater or feed, and absorbs CO_2 from the ocean (Wageningen University & Research, 2022b). Insects require very little space, water, and feed and they emit a lot less greenhouse gasses, like CO_2, compared to currently common sources of protein, such as cows and pigs (Oonincx, 2021; Wageningen University & Research, 2022a). Insects specifically are expected to be a valuable source of protein and other nutrients in the future. This is where the resistance to uncommon sustainable foods can be a challenge. Despite the high probability that we will rely on insects as food in the future (Wageningen University & Research, 2022a), the act of consuming insects as food (also known as entomophagy) is met with a lot of resistance from individual consumers. Entomophagy can provoke strong negative reactions, specifically disgust, in The Netherlands and other countries where insects are not a common source of nutrients (Jensen & Lieberoth, 2019; Sogari et al., 2018). This means that it is possibly harder to motivate people to engage in entomophagy than to motivate people to engage in customary diet-related PEB that does not include the consumption of insects. Thus, a relevant question to explore is how this resistance against entomophagy can be lowered. A factor that could influence the adoption of entomophagy is food neophobia. The level of food neophobia, which relates to a tendency to avoid unknown foods, is found to be predictive of the willingness to try insects (Hartman et al., 2015; Jensen & Lieberoth, 2019; Sogari et al., 2018; Verbeke, 2015). This is why it can be useful to explore how levels of food neophobia relate to the willingness to try sustainable foods, and (products with) insects specifically.

Current study

This current study aimed to compare the predictive value of the norm activation model and the goal-framing theory on the intention to engage in diet-related PEB. Additionally, the relationship between food neophobia and the intention to engage in customary diet-related PEB and entomophagy was explored. Entomophagy is a diet-related PEB, but it is also still an uncommon behaviour in the Netherlands that can elicit strong emotional reactions. Therefore,

most hypotheses have explored the intention to engage in customary diet-related PEB (which did not include entomophagy) and the intention to engage in entomophagy as separate independent variables. With this study, I aimed to explore which approach to motivating diet-related PEB is more effective: just normative motivations (based on the NAM) or a variety of motivations (based on the GFT). This study was a survey study with two conditions. Both conditions contained a text in which the participant is motivated to engage in diet-related PEB. One condition focussed on moral motivations (based on the NAM) and the other condition focussed on motivations based on three different goal frames (based on the GFT). In this study, the following hypotheses were tested:

Hypothesis 1a – The intention to engage in entomophagy will be higher for participants who experience lower levels of food neophobia compared to participants who experience higher levels of food neophobia.

Hypothesis 1b – The intention to engage in customary diet-related PEB will be higher for participants who experience lower levels of food neophobia compared to participants who experience higher levels of food neophobia.

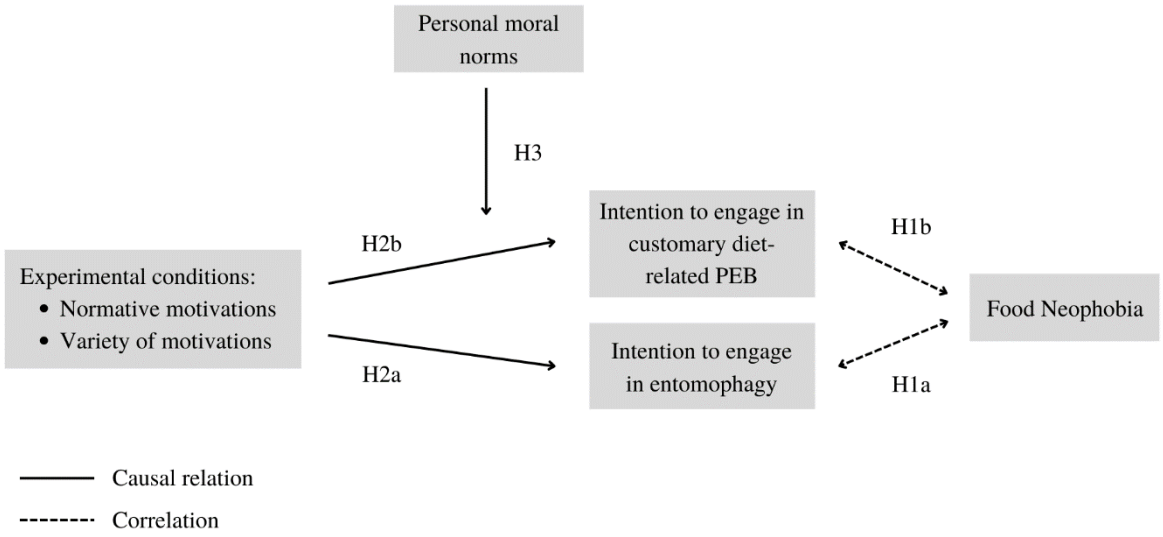
Hypothesis 2a – The intention to engage in entomophagy will not differ significantly when multiple motivations are addressed compared to when only moral motivations are addressed.

Hypothesis 2b – The intention to engage in customary diet-related PEB will be higher when multiple motivations are addressed compared to when only moral motivations are addressed.

Hypothesis 3 – The effect of the experimental conditions on the intention to engage in customary diet-related PEB will be stronger for participants who have strong personal moral

norms compared to participants who have less strong personal moral norms. Thus, strength of personal moral norms will be a moderator variable in this relationship.

Figure 2. Conceptual model of the hypotheses of this study



Method

Participants and design

The participants of this study were recruited through the social networks of the Master student, the office complex ‘De Pijp’ in Groningen and the internship foundation of the Master student, ‘Groener Groningen’. Participants were requested to share the survey within their own social network after completing it, thus resulting in snowball sampling. The survey was shared through Whatsapp-messages, emails, social media platforms and the website of Groener Groningen. There was a total of 204 responses, of which 104 were included in the analysis. 65 participants were excluded because they left more than five questions unanswered, 28 participants were excluded because they incorrectly answered the manipulation and attention checks, and 7 participants were excluded because they checked ‘do not use my responses’ or left this question blank. The sample consisted of 62 females and 40 males. Additionally, 2 participants did not identify as male or female, or preferred not to disclose their gender. The participants' age ranged from 17 to 73 (M = 38.19, SD = 15.73). The most common educational level in the sample was a Master’s degree (44.2%), followed by a Bachelor’s degree (31.7%), secondary vocational education, (18.3%) and high school degree or other (5.8%). In terms of diet, 25 participants were vegetarian (24%) and 7 participants were vegan/plant-based (6.7%). The results of an a priori power analysis based on ANCOVA test, showed that a sample of 111 participants was needed to achieve an effect size of f = 0.4 and a power of 0.8. This sample size was not acquired, thus the reliability of this study can not be assured.

Conditions

The experimental conditions of the study were structured as following: participants were requested to read a piece of text displaying motivations to choose a plant-based meat substitute. There were two conditions, namely the moral motivations condition and the

multiple motivations condition (Appendix A covers the conditions in full text). The motivations for engaging in the aforementioned diet-related PEB differed between the conditions. The moral motivations condition included moral arguments to engage in the PEB, as well as morally negative consequences for not engaging in the PEB. The multiple motivations condition included motivations to engage in the PEB based on three different goal frames, namely normative-, hedonic- and gain goal frames. In this between-subjects experimental design, participants were randomly assigned to one of the two conditions. The moral motivations condition had 59 participants and the multiple motivations condition had 45 participants.

Procedure and materials

The survey was piloted by people from the board of Groener Groningen 2022-2023 and people from the social network of the Master student. Based on the feedback of these pilot-participants on the content and format of the questions, the survey was improved. The data collection for this study consisted of self-reports. Participants were invited to partake in the study with a message that was distributed through social media platforms. The message included a link to the survey, which was accessible on the digital survey platform ‘Qualtrics’. The survey was advertised (without monetary compensation) on the website and social media platforms of Groener Groningen. Participants had the option to fill out the survey on their electronic device of choice, which took approximately 15 minutes. Participants had the opportunity to contact the researchers involved in the study with questions or comments about the survey at any moment. Participation was voluntary and there were no rewards for participation. Participants were asked for their consent digitally and were presented with a debriefing after completing the survey, as well as a request to share the survey within their personal social network.

Measures

The survey was also used to collect data for an internship project, but only measures relevant to this thesis paper will be described below. Since the survey was also offered in Dutch, the wording of some of the items was slightly changed to maintain the meaning of the original items. The survey was constructed with the measures described below.

Manipulation & attention check

To assure that participants attentively read the text preceding the survey, participants were asked to answer the following multiple choice question: "What is, according to the text, a reason to make more sustainable food choices?". The answer options of this question were taken directly from the text of the two different conditions. Additionally, the participants were asked to indicate whether their answers should be used at the end of the survey. The two answer options were: "Yes, I filled out this survey seriously and truthfully", and "No, do not use my answers for this study".

Demographics

Participants were asked to indicate their age, gender, and level of education.

Personal moral norms

To measure strength of personal moral norms, a scale from Shin et al. (2018) was used. The scale was made up of 4 items on a 7-point Likert scale (from 1 = *Totally disagree* to 7 = *Totally agree).* Participants were asked to indicate to what degree they agree with the following statements: "I believe I have a moral obligation to make sustainable food choices", "Making sustainable food choices is consistent with my moral principles", " My personal values encourage me to make sustainable food choices", and "I have a moral responsibility to make sustainable food choices". The scale for personal moral norms displayed good reliability with Cronbach's alpha of $\alpha = 0.949$ ($M = 5.48$, $SD = 1.36$).

Food neophobia

The level of food neophobia was assessed with a scale as used by Sogari et al. (2018). The scale contained 9 items on a 7-point Likert scale (from 1 = *Totally disagree* to 7 = *Totally agree).* Participants were asked to indicate to what degree they agree with statement regarding novel food choices, a few of which being: "I don't trust new foods", "If I don't know what a food is, I won't try it" and "I am afraid to eat things I have never had before". The scale for food neophobia displayed good reliability with Cronbach's alpha of $\alpha = 0.899$ (M = 2.63, SD = 1.10).

Intention to engage in customary diet-related PEB

The intention to engage in customary diet-related PEB was assessed with items based on Sogari et al. (2018) and Shin et al. (2018). The scale contained 4 items on a 7-point likert scale (with 1 = *Totally disagree* to 7 = *Totally agree*). Participants were asked to indicate to what degree they agree with statements regarding sustainable food choices. Some of the statements were: "I intend to make more sustainable food choices", "I am planning to make more sustainable food choices". The intention to engage in diet-related PEB displayed good reliability with Cronbach's alpha of $\alpha = 0.844$ ($M = 5.09$, $SD = 1.18$).

Intention to engage in entomophagy

The intention to engage in entomophagy was assessed with items based on Sogari et al. (2018) and Shin et al. (2018). The scale was made up of 4 items on a 7-point likert scale (with 1 = *Totally disagree* to 7 = *Totally agree*). Participants were asked to indicate to what degree they agree with statements regarding entomophagy. Some of the statements were: "I intend to eat insects", and "I am planning to eat products with insects". The intention to engage in entomophagy displayed good reliability with Cronbach's alpha of $\alpha = 0.938$ (M = 3.14, SD = 1.76).

Results

Firstly, two simple linear regression analyses were conducted to determine whether level of food neophobia is related to the intention to engage in entomophagy and the intention to engage in customary diet-related PEB. Food neophobia explained a significant amount of variance in the intention to engage in entomophagy ($F(1,102) = 27.4$, $p = < .001$, $R^2_{adjusted} = .204$). The regression coefficient ($B = -.735$) indicates that when a participant scored one point higher on food neophobia, on average a decrease of .735 on the intention to engage in entomophagy was found. Thus, the hypothesised relation (1a) between level of food neophobia and intention to engage in entomophagy is supported by the results. Food neophobia also explained a significant amount of variance in the intention to engage in customary diet-related PEB ($F(1,102) = 10.53$, $p = .002$, $R^2_{adjusted} = .085$). The regression coefficient ($B = -.329$) indicates that when a participant scored one point higher on food neophobia, on average a decrease of .329 on the intention to engage in customary diet-related PEB was found. The hypothesised relation (1b) between level of food neophobia and intention to engage in customary diet-related PEB is supported by the results. However, there is a noteworthy difference in how level of food neophobia relates to the intention to engage in entomophagy ($B = -.735$) customary diet-related PEB (B = -.329).

A one-way unpaired T-test was conducted to assess how the multiple motivations condition affects the intention to engage in entomophagy and customary diet-related PEB compared to the moral motivations condition. Firstly, participants in the multiple motivations condition did not report significantly different levels of intention to engage in entomophagy (M = 3.1 SD = 1.7) compared to the participants in the moral motivations condition (M = 3.2, SD = 1.8), $t(102) = -.214$, $p = .831$. Thus, no evidence was found that the intention to engage in entomophagy differs significantly between the two conditions. This shows support for hypothesis 2a, stating that the intention to engage in entomophagy does not differ between the

different conditions. Secondly, participants in the multiple motivations condition reported significantly lower levels of intention to engage in customary diet-related PEB (M = 4.8, SD = 1.4) compared to the participants in the moral motivations condition (M = 5.3 SD = 0.9), t(102) = -2.13, p = .018. However, Levene's test also proved significant with a $p < .05$, implying a violation of the equal variance assumption. Therefore, a Welch test was also conducted, which proved significant with $F_{welch}(1,70.67) = 4,06$, p = .048, confirming that the intention to engage in customary diet-related PEB differs significantly between the two conditions. When looking at the aforementioned mean scores of intention to engage in customary diet-related PEB for the two conditions, it can be concluded that participants in the moral motivations condition reported a significantly higher intention to engage in customary diet-related PEB compared to the participants in the multiple motivations condition. Thus, no support was found for hypothesis 2b, which stated that the intention to engage in customary diet-related PEB is stronger when multiple motivations are addressed compared to when only moral norms are addressed. In fact, the opposite effect was found: the intention to engage in customary diet-related PEB is stronger when moral motivations are addressed.

In order to further test hypothesis 2b and to test the final hypothesis, a simple linear regression analysis with the experimental conditions and the intention to engage in customary diet-related PEB was conducted. A significant amount of variance in the intention to engage in customary diet-related PEB was explained by the experimental conditions ($F(1,102) = 4.54$, p = .035, $R^2_{adjusted}$ = .033). The regression coefficient (B = -.246) indicates that for participants in the multiple motivations condition, a decrease of .246 was found on the intention to engage in customary diet-related PEB compared to participants in the moral motivations condition.

A moderated multiple regression analysis was conducted with the experimental condition as the independent variable, personal moral norms as moderator variable and the

intention to engage in customary diet-related PEB as the dependent variable. The analysis was conducted to test whether the aforementioned relationship between the experimental condition and the intention to engage in customary diet-related PEB is moderated by personal moral norms. No significant effect was found when controlling for food neophobia, with $p = .691$. The interaction between personal moral norms and the experimental conditions was found not significant [B = -0.41, 95% C.I. (-.434, .106), $p = .231$]. This means that no significant differences were found in the intention to engage in customary diet-related PEB for different strengths of personal moral norms, therefore not identifying personal moral norms as moderator in the relationship between the experimental conditions and the intention to engage in customary diet-related PEB. These results show that the effect of the experimental conditions on the intention to engage in customary diet-related PEB is not significantly stronger for participants who have strong personal moral norms compared to participants who have weaker personal moral norms, thus not supporting the final hypothesis.

Discussion

With this study, I aimed to explore the effect of the NAM and the GFT on the intention to engage in diet-related PEB, as well as the relationship between the intention to engage in diet-related PEB and food neophobia. Firstly, based on several sources (Ajzen, 1991; Bratt, 1999; De Groot et al., 2021; De Groot & Steg, 2009; Han et al., 2016; Hartman et al., 2015; Jensen & Lieberoth, 2019; Lindenberg & Steg, 2007; Schwartz, 1977; Shin et al., 2018; Sogari et al., 2018; Steglich, 2003; Verbeke, 2015), I hypothesised that lower intentions to engage in entomophagy and customary diet-related PEB would relate to higher levels of food neophobia (H1a & H1b). Secondly, I expected the experimental conditions to not have a significant effect on the intention to engage in entomophagy (H2a). However, I did expect that people are more likely to engage in customary diet-related PEB when they have been informed about multiple types of motivations compared to only moral motivations. Thus, I expected participants in the multiple motivations conditions to report a higher intention to engage in customary diet-related PEB than participants in the moral motivations condition (H2b). Finally, I hypothesised that the effect of the experimental conditions on the intention to engage in customary diet-related PEB to be affected by the strength of personal moral norms. Thus, I expected personal moral norms to be a moderating variable in the relationship between the experimental conditions and the intention to engage in customary diet-related PEB (H3).

The results from this study supported hypotheses 1a and 1b, which showed that a high level of food neophobia is related to lower levels of intention to engage in entomophagy and customary diet-related PEB. Results from this study also supported hypothesis 2a, showing that the intention to engage in entomophagy was not affected by the experimental conditions. Hypothesis 2b, which stated that being exposed to the multiple motivations condition would result in a higher intention to engage in customary diet-related PEB compared to being

exposed to the moral motivations condition, was not supported by the results. Finally, results from this study did not support hypothesis 3, showing that the relationship between the experimental conditions and the intention to engage in customary diet-related PEB was not moderated by the strength of personal moral norms.

Theoretical and practical implications

When considering the theoretical implications for this study, the results are partly in line with literature on this topic. Firstly, the results of this study support the literature on food neophobia and entomophagy. It has been shown that high levels of food neophobia are related to lower levels of entomophagy (Hartman et al., 2015; Jensen & Lieberoth, 2019; Sogari et al., 2018; Verbeke, 2015), which is supported by the results of this study. Thus, this study adds to the literature that confirm the relationship between food neophobia and entomophagy. As mentioned in the results, there was a difference in how food neophobia relates to entomophagy and customary diet-related PEB, where the relation between food neophobia and entomophagy was the strongest. This means that food neophobia is not as strongly related to customary diet-related PEB as to entomophagy, but might still have a predictive value. The results of this study show the not yet before explored relation between food neophobia and the intention to engage in customary diet-related PEB. The reason that food neophobia could be a relevant influence on the intention to engage in customary diet-related PEB is because customary diet-related PEB can include the consumption of foods someone has not yet tried before, like eating a plant-based meat alternative or seasonal foods.

Secondly, the results do not support the idea that it is most effective to motivate customary diet-related PEB from different perspectives, as was proposed by the GFT (Lindenberg & Steg, 2007; Steglich, 2003). Instead, the results of the study are in line with the literature on the NAM and PEB, which shows that motivating diet-related PEB from a

normative perspective is most effective (De Groot & Steg, 2009; Govaerts & Olsen, 2022; Han et al., 2016; Shin et al., 2018). The literature on motivating PEB shows support for both the GFT and the NAM (Ajzen, 1991; Bratt, 1999; De Groot et al., 2021; De Groot & Steg, 2009; Han et al., 2016; Lindenberg & Steg, 2007; Schwartz, 1977; Steglich, 2003). However, literature on diet-related PEB specifically is limited and relatively ambiguous on what approach can best be taken when comparing the GFT and the NAM. Thus, the results from this study can be a valuable addition to the knowledge on this topic. This study shows that when people are presented with normative based benefits of a customary diet-related PEB and the consequences of not engaging in this behaviour, they are more likely to engage in customary diet-related PEB than when information about motivations based on normative-, hedonic- and gain goal frames are presented.

A reason that the results of this study are not in line with the literature on the GFT, might be that hedonic- and gain- goal frames do not play as big of a role in customary diet-related PEB as expected. It is possible that customary diet-related PEB is mainly a normative pro-social behaviour and is best explained by the NAM (Steg & De Groot, 2010). However, especially at the time people participated in the study, inflation was a relevant topic for Dutch citizens (Centraal Bureau voor de Statistiek, 2022), which relates to the protection and acquisition of resources. Thus, I was expecting the gain goal frame based information especially to be a relevant factor for engaging in a certain behaviour. The fact that this was apparently not the case could be explained by the fact the hedonic goal possibly weighed more heavily for people than the gain goal. Thus, the monetary benefit might not have been as important as I expected: people might be of the opinion that the pleasure of eating meat is worth the money, which would explain why the multiple motivations did not influence the intention to engage in customary diet-related PEB as much as the normative motivations did.

An alternative explanation might be that there was a flaw in the design of the study, specifically the design of the multiple motivations condition. The way the text in the experimental condition was written might have led to a conflict between the goal frames, resulting in the decision not to engage in customary diet-related PEB. It has been shown that people tend to be protective of their pleasures and expect that engagement in normative behaviour can lead to lower levels of comfort, as explained by the hedonic goal frame (McKenzie-Mohr, 2000). In the multiple motivations condition of the current study, the hedonic goal frame was represented by the benefit of a plant-based meat alternative being easy and quick to prepare. The gain goal frame was represented by the benefit of a plant-based alternative being cheaper than meat. Lindenberg and Steg (2007) propose that multiple goal frames should be offered when motivating normative behaviour in order to reduce conflict between the normative goal frame and the hedonic- and gain-goal frames, and that the different goal frames should support the same behaviour. However, in order for this to be effective, all representations of the goal frames should be relevant. It is possible that people experienced conflict between the normative goal frame and the hedonic- and gain-goal frames due to the way the two goal frames were represented in the experimental condition. In the case of this study, people might not actually have considered the arguments based on the hedonic- and gain goal frames as sufficient support for the normative arguments. For example, the pleasure of eating animal products might have been stronger than the proposed benefits of a plant-based meat alternative (easy to prepare, saving money). This could explain why people were not as motivated by the arguments in the multiple motivations condition to engage in customary diet-related PEB as by the arguments in the moral motivations condition.

Additionally, the results could be explained by the fact that people tend to act in line with their moods when they view something from a hedonic goal frame (Lindenberg & Steg, 2007). Even thought entomophagy was only briefly mentioned in a text preceding the

questions about intention to engage in customary diet-related PEB, it is possible that the introduction of the concept of insects as human food still elicited strong negative emotions in the participants. For the people who were considering customary diet-related PEB from the hedonic goal frame, this negative emotional response might have led them to be even less motivated to engage in customary diet-related PEB, as they are more likely to act in line with their moods. Instead of the multiple goal frames acting a support for diet-related PEB, the fact that participants in the multiple motivations conditions were introduced to other goal frames besides the normative goal frame, might have actually provided an opportunity for people to worry about these goal frames. The fact that the hedonic and gain goal frames were not brought to the attention of participants in the moral motivations conditions, could explain why the results of this study do not support the idea of motivating diet-related PEB with arguments from multiple goal frames.

As far as I am aware, there is no literature on how the GFT and NAM influence entomophagy. The expectation that the intention to engage in entomophagy would not differ between the experimental conditions was supported by the results of this current study. A possible explanation for this would be that the influences of considering different goal frames or normative motivations are not strong enough to motivate a behaviour that is very controversial and uncommon in The Netherlands, such as entomophagy. Despite the fact that these results do not add to existing literature on the specific relationship, they can be a valuable addition to the knowledge we have on motivating diet-related PEB. As mentioned before, it is very likely that insects will become an important food source in the future, and therefore a relevant diet-related PEB. In order to explore to the fullest how diet-related PEB can be motivated, it is important to not only consider customary diet-related PEB that are common now, such as plant-based foods, but also diet-related PEB have the potential to

become very relevant in the future. Even if it is a behaviour that many people see as strange at the moment, such as entomophagy.

Finally, the results of this study are not in line with the literature on personal moral norms as a stable factor predictive of the intention to engage in PEB (Blamey, 1998; Stern et al., 1986). A possible explanation for this, is that personal norms have a mediating (Ajzen, 1991; Bratt, 1999; De Groot et al., 2021; De Groot & Steg, 2009) rather than a moderating role: someone's personal norms are not fixed, but can be influenced by AC and RR, which in turn leads to behavioural change. In the case where personal norms had been considered in the same way that the NAM proposes instead of as a separate influence on the intention to engage in diet-related PEB, the results of this study might have been different. Another explanation could be that personal norms are not as influential as expected, and that other factors predict diet-related PEB better. As has been argued by Lindenberg & Steg (2007), PEB is possibly not exclusively a normative behaviour, and could be influenced by more than just people's personal norms. For example, people might also consider hedonic goals and gain goals in their decision whether or not to engage in a certain behaviour, as has been explained by the GFT. However, results of the current study do not show support for this explanation.

An alternative factor that might explain diet-related PEB better than different goal frames or personal moral norms as a stand-alone influence could be taken from the theory of planned behaviour (TPB) (Ajzen, 1991). TPB states that behaviour is influenced by, among other factors, social norms. Thus, rather than people basing their actions on whether they believe it is the 'right thing to do', they might be more concerned with whether the action is accepted and valued by people around them (Ajzen, 1991). This could mean that the reported intention to engage in diet-related PEB might have been influenced by whether someone thinks the diet-related PEB proposed in the current study is considered 'normal' by others. Therefore, is it important to consider how diet-related PEB was introduced and explained to

the participants of the current study. As described in the method section, diet-related PEB was referred to in the study as sustainable food choices, with examples being ‘plant based products, like meat substitutes, ‘local and seasonal products’ and ‘other sustainable foods, like seaweed or insects’. The consumption of plant based, local and seasonal products are generally accepted by Dutch citizens. However, the consumption of insects is still an uncommon, and possibly controversial, behaviour (Jensen & Lieberoth, 2019). Therefore, social norms might have influenced the intention to engage in diet-related PEB more strongly than personal moral norms when considering the acceptance of entomophagy as sustainable food choice.

As for the practical implication of this study, a few things should be considered. Firstly, the results show that customary diet-related PEB is best motivated from a normative point of view with both benefits of the PEB and negative consequences of not engaging in the PEB given. Thus, it might be useful to focus on these arguments (i.e. ‘it is good for the planet’, ‘you avoid negative consequences of non-PEB’, ‘you help fight climate change’, etc.) when designing interventions aimed at motivating diet-related PEB. This might be more effective than making people aware of other factors like monetary benefits (i.e. ‘it saves you money’). However, as mentioned before, it might be good to keep in mind that the design of the experimental conditions possibly influenced the effectiveness of the multiple motivations condition on the intention to engage in customary diet-related PEB. Thus, I would not advise practitioners to design an intervention aimed at motivating diet-related PEB purely based on moral motivations, but to take a more nuanced approach.

Secondly, something that caught my attention was that many participants engaged in conversations with me about entomophagy after completing the survey. Multiple participants stated that they were already adopting a vegetarian or plant-based diet at the time of participation, and that they were reluctant to engage in entomophagy at least partly because of

animal wellbeing. These participants explained that their interest had been piqued by the idea of entomophagy but that they found it difficult to formulate a definitive opinion on the topic. Thus, when considering the practical application of the results of this study, it might be interesting to focus on entomophagy and how the intention to engage in this behaviour is influenced by what other diet-related PEB people already engage in. It became apparent from conversations with the aforementioned participants that many of them had very little knowledge about entomophagy and why it is an effective way to mitigate climate change. Campaigns to increase entomophagy could focus on the normative motivations and environmental benefits of entomophagy as well as normalizing insects as a source of food for humans in an attempt to make the idea less foreign.

Limitations and directions for future research

I will now discuss possible limitations of the current study, as well as potentially interesting directions for future research within the topic of diet-related PEB. Firstly, the design of the study was an online experimental survey study, with a smaller sample size than desired. Despite there being manipulation and attention checks in the survey, I cannot assure that participants read the text in the experimental conditions carefully and fully understood everything. However, the experimental conditions were as concise as possible and information was expressed with images in order to draw the participant's attention.

Secondly, when considering future studies on the topic of diet-related PEB, I recommend that other experimental designs are considered in order to increase the validity of the results. For example, in order to improve external validity of the results, an experimental study could be conducted where actual engagement in diet-related PEB is measured rather than the intention to engage in diet-related PEB. Additionally, as has been mentioned, the conceptualization of the goal frames from the GFT might not have been successful, thus

possibly interfering with the effect that the arguments from different goal frames might have had on the intention to engage in diet-related PEB. Since, due to the design of the study, it is not possible to test whether this was the case, I would recommend caution when interpreting the results related to this hypothesis. For future research, it could be valuable to explore how experimental conditions based on the GFT can be designed most effectively, and whether the intention to engage in diet-related PEB could be explained by the GFT.

As for future directions, there are a few possibly interesting topics to elaborate on. Firstly, the motivations to engage in diet-related PEB were based on the NAM. Here it is worth mentioning that not every aspect of the NAM was included. Specifically, based on the literature it was decided that AR would be relevant to include in the experimental condition, since it seemed to be a relevant aspect of the NAM for predicting diet-related PEB. The results of this study might have been different if personal norms and RR were also represented in the moral motivations condition as proposed by the NAM. For future research, it might be interesting to explore whether all parts of the NAM are relevant in predicting diet-related PEB, or, as has been shown in the results of the current study, AR could be a predictor of it's own.

Another direction for future research might be to explore how entomophagy can be motivated. High levels of food neophobia relate to low levels of intention to engage in entomophagy. Thus food neophobia is a relevant influence for a behaviour that is likely to become a relevant diet-related PEB in the future. It can be valuable to look into how food neophobia can be reduced and whether this change is long-term. The current study confirms the findings that high levels of food neophobia cause people to avoid foods they do not know, thus relating to a low intention to try uncommon sustainable foods (Hartman et al., 2015; Jensen & Lieberoth, 2019; Sogari et al., 2018; Verbeke, 2015). Increased availability, exposure and positive first experiences with uncommon foods are known to negatively

influence food neophobia and positively influence the acceptance of uncommon foods (Jensen and Lieberoth; 2019, Onwezen et al., 2022; Sogari et al., 2018). For future research, it would be interesting to consider these factors and to what degree they play a role in uncommon diet-related PEB such as entomophagy.

Finally, as has been mentioned earlier, some participants of this study already engaged in diet-related PEB, namely adopting a (partly) plant-based diet, and personally contacted me to explain that this was the reason they were not very willing to engage in entomophagy. This is reason to consider that people who do not eat animal products might be motivated by different arguments to engage in diet-related PEB than people who do eat animal products. People follow a plant-based diet for a multitude of reasons (animal wellbeing, climate change, health considerations, etc.), and this is important to consider when exploring how vegetarians or vegans can be motivated to engage in diet-related PEB such as entomophagy. For example, people who are vegetarian or vegan in order to prevent animal cruelty, will likely be less motivated to engage in entomophagy than people who are vegetarian or vegan out of concern for the environment. Thus, it might be interesting to explore this difference between vegetarians/vegans and people who eat animal products, and whether they are motivated to engage in entomophagy by different arguments.

Conclusion

Based on the results of this study, I conclude that presenting people with moral motivations can lead to a higher intention to engage in diet-related PEB than presenting people with multiple different motivations. Additionally, high levels of food neophobia were strongly related to low levels of intention to engage in customary diet-related PEB and entomophagy, and with insects likely being an important food source in the future, this should be considered when motivating sustainable food choices. One of the most important

limitations of this study is that the design of the experimental conditions might not have been effective, thus affecting the reliability of the results on how the GFT and NAM influence the intention to engage in diet-related PEB. A future direction for research I would like to emphasize is the exploration of how food neophobia plays a role in the intention to engage in entomophagy, and how someone's (reasons for their) current diet relates to entomophagy. As mentioned before, I am of the opinion that more research on this topic should be conducted in order to design effective interventions that are based on motivation diet-related PEB.

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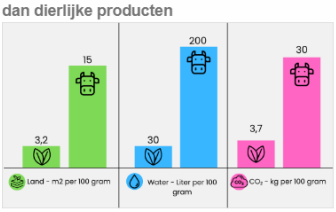
Appendix A

Conditions in full text

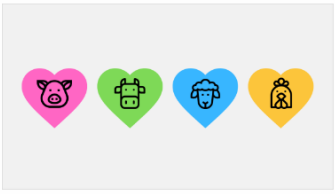
Condition with moral motivations (in Dutch and English)

Het kopen van een vleesvervanger is een duurzame voedingskeuze en heeft meerdere voordelen, namelijk:

- Vleesvervangers zijn beter voor de planeet dan dierlijke producten



- Geen dierenleed



Het maken van niet duurzame voedingskeuzes heeft negatieve gevolgen, namelijk:

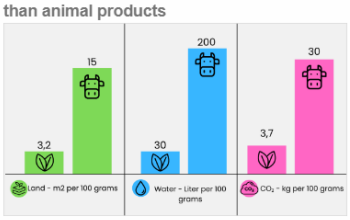
- Slecht voor het klimaat

- Dierenleed

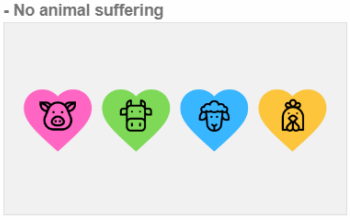
Bronnen:
https://www.vegetariers.nl/organisatie/pers/persberichten/nederlander-eet-in-zijn-leven-522-dieren
https://weekzondervlees.nl/wp-content/uploads/2020/12/Verantwoording-besparingen-Nationale-Week-Zonder-Vlees-2021.pdf
https://www.cdc.gov/climateandhealth/effects/default.htm
https://www.worldwildlife.org/threats/effects-of-climate-change#:~:text=More%20frequent%20and%20intense%20drought,on%20people's%20livelihoods%20and%20communities.&text=As%20climate%20change%20worsens%2C%20dangerous,becoming%20more%20frequent%20or%20severe
https://www.natureandculture.org/new-water-protection-area-safeguards-water-for-indigenous-guarancas-kichwa/
https://public.wmo.int/en/media/press-release/state-of-climate-2018-shows-accelerating-climate-change-impacts

Buying a meat substitute is a sustainable food choice and has the following benefits, namely:

- Meat substitutes are better for the planet than animal products



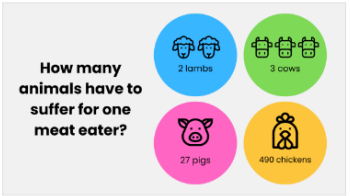
- No animal suffering



Not making a sustainable food choice has the following negative consequences, namely:

- Bad for the planet

- Animals will suffer



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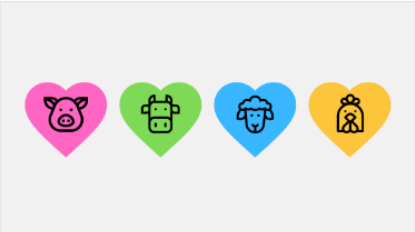
https://www.cdc.gov/climateandhealth/effects/default.htm
https://www.worldwildlife.org/threats/effects-of-climate-change#:~:text=More%20frequent%20and%20intense%20drought,on%20people's%20livelihoods%20and%20communities.&text=As%20climate%20change%20worsens%2C%20dangerous,becoming%20more%20frequent%20or%20severe
https://www.natureandculture.org/new-water-protection-area-safeguards-water-for-indigenous-guarancas-kichwa/
https://public.wmo.int/en/media/press-release/state-of-climate-2018-shows-accelerating-climate-change-impacts

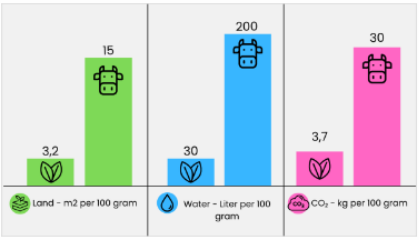
Condition with multiple motivations (in Dutch and English)

Het kopen van een vleesvervanger is een duurzame voedingskeuze en heeft meerdere voordelen, namelijk:

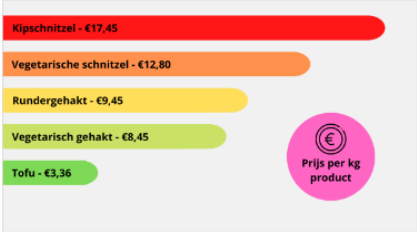
- Geen dierenleed



- Vleesvervangers zijn beter voor de planeet dan dierlijke producten



- Vleesvervangers zijn goedkoper dan vlees



- Vleesvervangers zijn makkelijker te bereiden dan dierlijke producten. De vleesvervanger hoeft alleen opgewarmd te worden en je hoeft niet op te letten of hij wel gaar is.

Bronnen:
https://weekzondervlees.nl/wp-content/uploads/2020/12/Verantwoording-besparingen-Nationale-Week-Zonder-Vlees-2021.pdf
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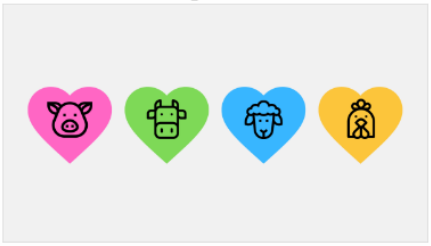
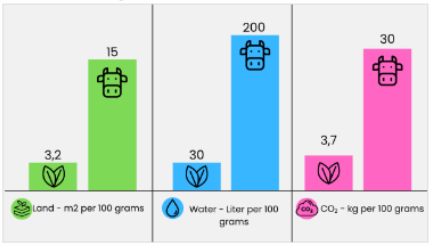
Buying a meat substitute is a sustainable food choice and has the following benefits, namely:

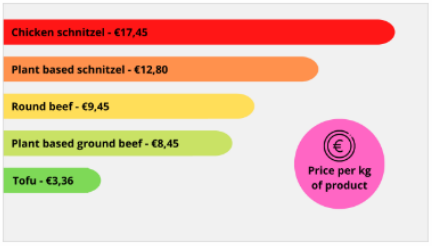
- No animal suffering



- Meat substitutes are better for the planet than animal products



- Meat substitutes are cheaper than meat



- Meat substitutes are easier to prepare than animal products. You only have to warm up the meat substitute and do not have worry about it being undercooked.

Sources:
https://weekzondervlees.nl/wp-content/uploads/2020/12/Verantwoording-besparingen-Nationale-Week-Zonder-Vlees-2021.pdf
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