Research report

Moral intensity and climate-friendly food choices

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ABSTRACT

By changing individual food consumption patterns, it might be possible to reduce greenhouse gas emissions associated with climate change. The aim of the current study was to examine how perceptions of the moral intensity of climate change are related to climate friendly-food choices. The participants were 350 Finnish university students in the social and behavioral sciences who completed a questionnaire during class. The results indicated that moral perceptions mainly affected the moral evaluation and intentions to make climate-friendly food choices. We suggest that the results can be used to promote climate-friendly food choices, for example, by increasing the recognition of climate change as a moral imperative and by combining environmental motives with other relevant food choice motives.

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Introduction

Food production and consumption contribute significantly to the acceleration of global climate change. About 10–20% of the world's greenhouse gas emissions derive from food production and consumption in developed nations (FAO, 2006). Technological improvements are essential for mitigating greenhouse gas emissions in food production, but the development and adoption of the latest technological innovations may take years, nor is this enough to achieve a necessary mitigation level. Therefore, it is necessary to combine technological improvements with immediate behavioral changes in the patterns of individual food consumption (Garnett, 2007). A number of scholars have argued that by reducing the individual consumption of meat and dairy products as well as the production of food waste, it should be possible to reduce greenhouse gas emissions significantly (Fiala, 2008; Popp, Lotze-Campen, & Bodirsky, 2010; Stehfest et al., 2009; York & Gossard, 2004).

Environmentally significant actions such as climate-friendly behavior are affected by a broad range of factors. In general, behavior depends on attitudinal factors (e.g. norms, beliefs, and attitudes), personal capabilities (e.g., knowledge, skills, and resources), structural/contextual factors (e.g., supportive policies and laws/regulations), and habit/routine (Stern, 2000). Climate-friendly food consumption seems to be challenging for consumers. There is evidence that individuals are not necessarily aware of the environmental impact of their food choices and that they have difficulties assessing these impacts (Tobler, Visschers, & Siegrist, 2011b). For instance, consumers seem to overestimate the

environmental impact of packaging material (Lea & Worsley, 2008; Tobler et al., 2011b), but underestimate the environmental impact associated with meat consumption (Lea & Worsley, 2008). Furthermore, although eating less meat is an easy, cheap, and effective way to be more climate-friendly; people are not necessarily willing to reduce their meat consumption. As an example, unfamiliarity, food neophobia, and perceived sensory unattractiveness are shown to be obstacles to using meat substitutes (Hoek et al., 2011), while following a plant-based diet is often viewed as difficult and undesirable (Lea, Crawford, & Worsley, 2006). In addition, people do not seem to recognize the option of eating less meat as a climate-friendly food choice (de Boer, Schösler, & Boersema, 2013).

On the other hand, environmental concern is shown to be one of the most important facilitators of environmental action (Wakefield, Elliott, Eyles, & Cole, 2006). Environmental concern has usually been defined as a general attitude or value orientation towards the environment (Fransson & Gärling, 1999). Previous research has shown that norms, values, and moral evaluations increase pro-environmental actions in general and the willingness to mitigate climate change in particular (e.g., Leiserowitz, 2006; Nilsson, von Borgstede, & Biel, 2004; Stern, 2000; Vainio & Mäkiniemi, 2012; Vainio & Paloniemi, 2011). For instance, it has been shown that those who perceive climate change as a moral issue have significantly higher levels of concern about climate change, greater risk perceptions, and stronger perceptions of scientific consensus on the issue, and they perceive themselves as possessing greater ability to do something about climate change as compared to those who do not perceive climate change as a moral question (Markowitz, 2012).

However, non-experts' moral perceptions of climate change and particularly their relationship to action have remained relatively

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unexamined, although it has been suggested that individuals' failure to identify climate change as a moral issue may pose a significant barrier to action (APA, 2010; Markowitz, 2012). The current study endeavors to fill the need for such research by examining how the perceptions of climate change as a moral issue relate to individuals' climate-friendly food choices.

Moral intensity of climate change

Jones (1991) proposed that every issue can be represented in terms of its moral intensity, and this intensity is likely to vary substantially from issue to issue. He proposed that moral intensity includes six components: magnitude of consequences, social consensus, probability of effect, temporal immediacy, proximity, and concentration of effect. The magnitude of consequences (MC) can be defined as the sum of the harms (or benefits) to victims (or beneficiaries) of the moral act in question. Social consensus (SC) describes the consensus or agreement on the rightness or wrongness of the consequences. The probability of effect (PE) is a joint function that refers to the fact that the act in question will actually take place and also cause harm (or benefit). Temporal immediacy (TI) of the moral issues is the supposed length of time between the present and the onset of the consequences of the moral act in question (a shorter length of time means greater immediacy). Proximity of the moral issue (PR) describes the feeling of nearness (social, cultural, psychological, or physical) that the moral decision-maker has to the act in question. Concentration of effect (CE) is an inverse function of the number of people affected by an act of a given magnitude. CE is high if a small number of people are significantly affected and low if a large number of people are affected only slightly.

Jones (1991) further proposed that issues of high moral intensity are those having large MC and a high degree of SC, PE, TI, PR, and CE. He argued that the whole moral decision-making process is highly influenced by the moral intensity of an issue and consists of four steps: 1. recognizing a moral issue, 2. moral judgment, 3. moral intent, and 4. moral behavior. More specifically, he formulated the following propositions regarding the effect of moral intensity on the moral decision-making process: 1. issues of high moral intensity will be recognized as moral issues more frequently than issues of low moral intensity; 2. issues of high moral intensity will elicit more sophisticated moral reasoning than issues of low moral intensity; 3. moral intent will be established more frequently whenever issues of high moral intensity are involved than when issues of low moral intensity are involved; and 4. moral behavior will be observed more frequently whenever issues of high moral intensity are involved than when issues of low moral intensity are involved.

In general, empirical evidence supports Jones's (1991) key assumption, namely, that moral thinking is issue-contingent: the moral intensity of an issue has an effect on moral decision making (e.g., Barnett, 2001; Bennett, Anderson, & Blaney, 2002; Frey, 2000; McMahon & Harvey, 2007; Singhapakdi, Vitell, & Kraft, 1996). However, previous research has focused especially on the effect of moral intensity on moral recognition, moral judgment, and moral intent. In other words, the effect of moral intensity on actual moral behavior has not been satisfactorily verified with empirical data (McMahon, 2002).

Yet empirical evidence does not support the original formulation of six components of moral intensity. There are inconsistent results regarding the number of components as well as the interactions between components (e.g., May & Pauli, 2002; McMahon & Harvey, 2006; Ng, White, Lee, & Moneta, 2009; Valentine & Silver, 2001). Moreover, the components of moral intensity are shown to be differently influential: in other words, some components seem to matter more than others in moral decision-making processes. As an example, in Barnett's (2001) study of work-related moral

actions, the perceived SC influenced an individual's recognition of a moral issue, moral judgments, and moral intentions, whereas the perceived TI did not have any effect.

We suggest that Jones's (1991) Issue-Contingent Model of Ethical Decision Making is especially well suited for studying climate-friendly actions, since the above-mentioned moral intensity components capture significant aspects of climate change. First of all, climate change is supposed to cause serious harm to the environment and to human beings (IPCC, 2007) (cf. the magnitude of consequences, MC), and these negative effects are not distributed evenly between the global south and north or between the rich and the poor; rather, the effects are more concentrated in vulnerable areas and groups of people (Roberts, 2001) (cf. the concentration of effects). Moreover, even though the vast majority of climate scientists accept the evidence for global warming as well as the argument that human activities are its principal cause, the public, politicians, economists, and journalists seem to have the impression that there is confusion, disagreement, or discord among climate scientists (Nisbet & Myers, 2007; Oreskes, 2004). In addition, the public view of climate change does not appear to be clearly consensual (Dunlap & McCright, 2008) (cf. social consensus). Furthermore, there is uncertainty regarding the probability and the immediacy of the effects of climate change. As an example, there are several estimates of the likelihood of negative effects of climate change to occur and how serious the consequences will be (IPCC, 2007) (cf. probability of effects, temporal immediacy). Climate change is often perceived as a distant threat, and the view of climate change as personally non-threatening or as not personally relevant has been shown to be an obstacle to mitigating actions (Lorenzoni, Nicholson-Cole, & Whitmarsh, 2007) (cf. Proximity). Although, as mentioned above, it seems that some components of moral intensity are more relevant and influential on moral decision-making processes than others, all moral components seem to be relevant to climate change as a multi-layered phenomenon. Consequently, any order of relevance or influence among these components of moral intensity is not included among our hypotheses.

As far as we know, the Issue-Contingent Model of Ethical Decision Making has not yet been applied to the study of environmental issues, although currently, environmental action is clearly entering a moral domain (e.g., Markowitz, 2012; Markowitz & Shariff, 2012). In addition, as described above, the Issue-Contingent Model is able to capture relevant aspects of climate change. Thus, the aim of the current study is to explore how the perceived moral intensity of climate change is related to individuals' climate-friendly food choices.

Hypotheses

Based on the studies presented above as well as Jones's (1991) original formulations, we propose three hypotheses concerning the effects of the moral intensity of climate change on separate steps of moral decision making together with two hypotheses regarding the relationships between the different steps in decision making.

H1. The perceived moral intensity of climate change increases the perception of climate-friendly food choices as morally right actions (moral evaluation).

H2. The perceived moral intensity of climate change increases an individual's intentions to make climate-friendly food choices (moral intention).

H3. The perceived moral intensity of climate change increases the likelihood of making climate-friendly food choices (moral action).

H4. Moral evaluation (the perception of climate-friendly food choices as morally right actions) increases the intention to make climate-friendly food choices.

H5. Intentions to make climate-friendly food choices increase the likelihood of making climate-friendly food choices.

Methods

Participants

A total of 350 Finnish undergraduate students in the social and behavioral sciences at the University of Helsinki and the University of Tampere filled out our questionnaire during their classes in "Introduction to Social Psychology" and "Current Trends in Social Sciences." Most of the participants were in their first or second year of study for the Bachelor's degree. All were Finnish natives, and the questionnaire was formulated in Finnish. Altogether 80% of the participants were females, reflecting the average gender distribution in the social and behavioral sciences. The mean age was 24 (SD = 7.05). Around 21% of the participants were vegetarians, whereas 79% also included meat in their diet. Information for informed consent was given to all participants before the data collection. All of the study procedures were executed according to the ethical codes of the Finnish Advisory Board on Research Ethics. Participation was voluntary, and the participants did not receive any compensation. The data were gathered in the fall of 2011.

Measurements

Perceptions of the moral intensity of climate change

A novel, 18-item measure called the Moral Intensity of Climate Change Scale (MICCS) was developed specifically for purposes of the current study. The MICCS builds on the 12-item Perceived Moral Intensity Scale (PMIS) (Frey, 2000; McMahon & Harvey, 2006; Singhapakdi et al., 1996), where the items are measured on a seven-point, Likert-type scale (1 = totally disagree and 7 = totally agree). There are three main differences between MICCS and PMIS. First, instead of the original general statements measuring the moral intensity of the decision scenarios presented, in MICCS the items are modified to measure directly the moral intensity of climate change. As an example, the original statement from PMIS – "The overall harm as a result of the decision will be very small" – was presented in MICCS as: "The overall harm of the climate change will be very small." Second, PMIS focuses on the direct or indirect consequences of decisions on human beings. PMIS includes questions such as whether the decision will affect people who are close to the decision-maker and whether harmful consequences will be concentrated on a small number of people. Taking into account that climate change will affect the environment as well as human beings, we added four new items focusing on the environmental consequences (CE09, CE18, PX08, and PX16). Third, since the social consensus dimension in PMIS focuses on the consequences on people and society in a general and abstract sense, we developed two new items measuring the effect of climate change on meaningful others, such as friends (SC01 and SC17), because "meaningful others" have been found to be important reference points in moral decision making (e.g., Trevino, 1986). Although MICCS and PMIS have their differences, the consistency of all the shared content was checked by a professional translator who was knowledgeable about social psychology and data collection methods.

In the questionnaire *Magnitude of Consequences* was assessed with the following two items: "The negative consequences of climate change will be very serious," (MC02), and "The overall harm as a result of climate change will be very small," (MC10, reverse score). *Social Consensus* was measured with these items: "Most people would disagree about the right way to act with regard to climate change," (SC03, reverse score), "Most people would agree about the right way to act with regard to climate change" (SC11), "Most of my friends would disagree about the right way to act with regard to climate change" (SC01), and "Most of my friends would agree about the right way to act with regard to climate change" (SC17). *Temporal Immediacy* was assessed with the following items: "Climate change is not likely to cause harm in the near future" (TI05, reverse score), and "The negative effects of climate change will be felt very quickly" (TI13). *Probability of Effect* was measured with the items "It is unlikely that climate change will cause any harm" (PE12, reverse score), and "Climate change is likely to cause harm" (PE04). *Proximity of Effect* was assessed with the items "The harmful effects of climate change will affect people close to me" (PX06), "The harmful effects of climate change will affect the nearby environment" (PX08), "The harmful effect of climate change will affect people far away from me" (PX14), and "The harmful effects of climate change will affect the environment far away from me" (PX16, reverse score). *Concentration of Effects* was measured with the following items: "The harmful effects of climate change will be concentrated on a small number of people" (CE07, reverse score), "The harmful effects of climate change will be concentrated on a small part of environment" (CE09, reverse score), "The harmful effects of climate change will affect a large number of people" (CE15), and "The harmful effects of climate change will affect the environment on a very large scale" (CE18).

Moral evaluation of climate-friendly food choices
The participants were requested to evaluate on a seven-point scale (totally morally wrong – totally morally right) whether "Making climate-friendly food choices" is a morally wrong or a morally right action.

Moral intentions of climate-friendly food choices
The participants were asked to indicate on a seven-point scale (highly unlikely – highly likely) ($\alpha = 0.92$) how likely they were to make regular climate-friendly food choices (a) during the next 6 months and (b) during the next 5 years.

Climate-friendly food choices
The participants were asked to indicate how frequently they personally made the following food-related choices in order to mitigate climate change by using a seven-point scale (1 = never, 2 = less than once a year, 3 = once or a few times a year, 4 = once or a few times during 6 months, 5 = once or a few times a month, 6 = once or a few times a week, and 7 = almost daily or daily). The following six statements (out of seven) were included in the analysis ($\alpha = 0.90$): "I try to select foods that have as small a negative climate effect as possible," "I favor local food," "I avoid the use of imported food products transported by air," "I eat seasonal food," "I limit the consumption of meat and dairy products," and "I try to limit food waste." High values on this scale indicated a high frequency of climate-friendly food choices. A search of the literature on the climate impact of food choices was conducted in order to develop the above-mentioned items (Carlsson-Kanyama & González, 2009; Fiala, 2008; Popp et al., 2010; York & Gossard, 2004).

Data analysis

An exploratory factor analysis using the Maximum Likelihood Method with orthogonal Varimax rotation was performed for measuring a dimensionality of MICCS. The Kaiser–Mayer–Olkin value

was .86, and Bartlett's Test of Sphericity reached statistical significance, indicating that factor analysis was an appropriate technique. Multiple linear regression analyses and hierarchical regression analyses were used to test the hypotheses. Preliminary analyses were conducted to ensure that there were no serious violations of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. For purposes of calculating mean scores for each main variable (i.e., moral intensity, moral evaluation, moral intentions, and food choices), the scores were re-coded prior to analysis so that higher scores indicate increased levels of the phenomenon measured. Mean scores were calculated for each participant by collapsing them across the items.

Results

A three-factor solution with a total of 42% of the variance explained was adopted, based on eigenvalues, scree plot, and interpretability. The analysis revealed five components with eigenvalues exceeding 1, but an inspection of the scree plot revealed a clear break after the third component. The first factor included items from the CE, MC, PE, and TI components. This factor reflected the perceived seriousness, probability, and concentration of the effects of climate change and was called the Probable Seriousness of Consequences. The second factor captured all SC items, and consequently, it was named Social Consensus with the focus on perceived social agreement about climate change. The third factor grouped the items from the PX component with the focus on the closeness of climate change and was called Proximity (Table 1). Cronbach's alphas of the factors indicated acceptable internal consistencies as shown in Table 2. In addition, three items – TI13, PX16 and PX14 – were excluded from further analysis due to their low factor loadings.

Means, standard deviations, alphas, and correlations for all main variables are presented in Table 2. In the context of climate change, Probable Seriousness of Consequences was the strongest dimension of moral intensity, followed by Proximity and Social Consensus. For the participants, making climate-friendly food choices was an issue that was morally right. In addition, the participants expressed strong intentions to make climate-friendly food choices. The most frequent self-reported climate-friendly food choices were limitation of food waste and consumption of local food as shown in Table 3.

Multiple regression analysis was performed to test whether the three moral intensity dimensions – Probable Seriousness of Consequences, Social Consensus, and Proximity – predict moral evaluations of climate-friendly choices (H1). Together moral intensity dimensions predicted 12% of the variance in moral evaluation ($R^2 = .12$, $F(3, 341) = 15.77$, $p < .001$). Probable Seriousness of Consequences was the only statistically significant predictor of moral evaluation (Table 4).

Social Consensus and Proximity did not predict moral evaluation, but, as shown in Table 2, they significantly correlated with moral evaluation, which indicated an interaction effect of the dimensions. Therefore, a multiple regression analysis was repeated with three moral intensity dimensions and the interaction term *Social Consensus * Proximity* as predictors. The interaction term was a statistically significant predictor of moral evaluation, $\beta = -.18$, $t(344)$, $p < .001$. This interaction also explained a significant but very small proportion of variance in moral evaluation, $R^2 = .03$, $F(1, 344) = 11.35$, $p < .001$. These effects were further analyzed by means of the simple slopes method by Aiken and West (1991), with conditional values for Social Consensus and Proximity calculated as one standard deviation above the mean and one standard deviation below the mean. The simple slopes analyses indicated one two-way interaction between the moral intensity dimensions.

Social Consensus increased moral evaluation only when Proximity was low ($\beta = .22$, $p < 0.001$), but not when Proximity was high ($\beta = -.02$, *n.s.*) (Fig. 1).

Hierarchical regression analysis was used to assess the ability of the moral intensity dimensions to predict intentions for making climate-friendly food choices after controlling for the effect of moral evaluation (H2, H4). Moral evaluation was entered at Step 1, explaining 5% of the variance in intention. Step 2 resulted in a significant increase in the explained variance. Moral intensity components explained an additional 22% of variance in intention ($R^{2\text{-change}} = .22$, $F^{\text{Change}}(3, 340) = 33.20$, $p < .001$). The total variance explained by the model as a whole was 27%. In the final model only two moral intensity components, Probable Seriousness of Consequences and Proximity, were statistically significant predictors of intention (Table 5).

Hierarchical regression analysis was used to test the ability of three moral intensity dimensions to predict climate-friendly food choices after controlling for the effect of intentions (H3, H5). Moral intention was entered at Step 1, explaining 65% of the variance in climate-friendly food choices. Step 2 resulted in a significant increase in the explained variance, although moral intensity components explained only an additional 2% of the variance in moral action ($R^{2\text{-change}} = .02$, $F^{\text{Change}}(3, 341) = 4.95$, $p < .001$). The total variance explained by the model as a whole was 66%. Moral Intention and the Probable Seriousness of Consequences were statistically significant predictors in the final model (Table 6).

Discussion

The aim of the current study was to examine how the moral perceptions of climate change relate to climate-friendly food choices. To our knowledge, this is the first time Jones's (1991) Issue-Contingent Model of Ethical Decision Making has been used in the domains of food consumption and climate change. Given that the moral aspects of food choices as well as the moral aspects of climate-friendly actions have not been intensively examined, we suggest that our research has extended and improved on previous studies by developing a novel means of measuring the moral perceptions of climate change (MICCS) and showing how these are related to climate-friendly food choices.

In contradiction to Jones's (1991) original assumptions, in our study the moral intensity of the climate change construct appeared to consist of three, not six, dimensions: 1. Probable Seriousness of Consequences. 2. Social Consensus. 3. Proximity. However, the Probable Seriousness of Consequences grouped items from MC, PE, CE, and TI together, illustrating that MICCS was able to capture relevant aspects of climate change. Consequently, the moral perceptions of climate change can be conceptualized and measured with the Issue-Contingent Model. In addition, although Jones's original factor structure was not confirmed, our results were very similar to those of McMahon and Harvey (2007) and those of Ng et al. (2009).

Our findings partly support Jones's (1991) basic assumption, namely, that the perceived moral intensity of an issue has an effect on the moral decision-making process. As hypothesized, the Probable Seriousness of Consequences predicted moral evaluation, which indicates that those who perceive climate change as a serious, probable, and influential problem are more willing to perceive climate-friendly food choices as morally right actions. Unexpectedly, Proximity and Social Consensus did not directly predict moral evaluation. Furthermore, the Probable Seriousness of Consequences and Proximity predicted intentions to make climate-friendly food choices, indicating that those who perceive climate change as a serious, probable, and influential problem occurring close to them are more likely to express the intention to make

Table 1
Factor loadings for exploratory factor analysis of the Moral Intensity of Climate Change Scale (MICCS).

Item	Probable seriousness of consequences	Social Consensus	Proximity
CE09	**−.79**	.13	−.16
CE18	**.77**	−.11	.25
MC10	**−.77**	.01	−.14
CE15	**.74**	−.07	.27
PE12	**−.67**	.09	−.17
MC02	**.66**	.07	.32
PE04	**.59**	.13	.09
TI05	**−.56**	.04	−.26
CE07	**−.50**	.13	−.28
SC01	−.18	**.75**	−.07
SC17	.18	**−.73**	.01
SC03	.06	**.46**	.15
SC11	−.08	**−.42**	−.15
PX06	.31	.04	**.71**
PX08	.28	.11	**.64**
TI13	.14	.06	.26
PX16	.17	.00	−.03
PX14	−.08	−.01	−.15
Eigenvalues	4.45	1.58	1.51
% Of variance	24.75	8.80	8.36
Factor means	6.05	3.70	4.77

Note: Factor loadings >.40 are in boldface.

Table 3
Means and standard deviations of self-reported climate-friendly food choices.

Climate-friendly food choice	M	SD
Limit food waste	5.10	1.96
Favor local food	4.37	1.72
Eat seasonal food	4.35	2.03
Select foods with as few negative climate effects as possible	4.17	1.89
Limit the consumption of meat and dairy products	3.87	2.34
Avoid the use of imported food products transported by air	3.68	1.85
Avoid vegetables grown in greenhouses	2.54	1.67

Table 4
Summary of regression analysis for variables predicting the moral evaluation of climate-friendly food choices.

Variable	B	SE B	β
MI: Probable seriousness of consequences	0.34	0.07	.30***
MI: Social Consensus	0.08	0.05	.09
MI: Proximity	0.03	0.04	.05

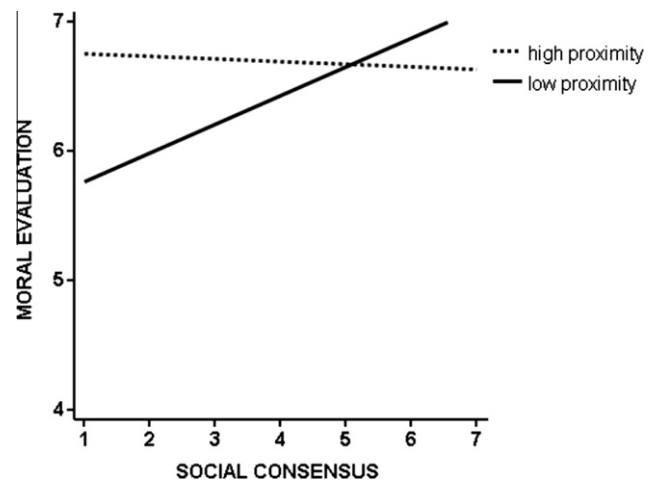*Note:* R^2 = .12, MI = Moral intensity dimension.
*** $p < .001$.

Fig. 1. The effect of Social Consensus on moral evaluation when Proximity is either low or high.

climate-friendly food choices. This finding indirectly supports the idea that the perception of climate change as personally non-threatening or irrelevant is one obstacle to climate change mitigating actions (Lorenzoni et al., 2007). Finally, the intention and the Probable Seriousness of Consequences predicted climate-friendly food choices. However, the effect of intention on action was strong, whereas the effect of the Probable Seriousness of Consequences was weak. The identified relationship between intention and action was stronger than in attitudinal studies in general (Wong & Mullan, 2009), which may explain why the dimensions of moral intensity had less effect on actual climate-friendly food choices. Together these findings indicate that the perceived moral intensity of climate change especially influences moral evaluation and the intentions to make climate-friendly food choices.

It also appears that the Probable Seriousness of Consequences was by far the most important of the three moral intensity dimensions. Probable Seriousness of Consequences was associated with all three steps (evaluation, intention, and action) of moral decision making and had the largest effect of the intensity dimensions. The explained variances of the moral intensity dimensions were quite low; however, they were similar to those reported in previous studies (e.g., Barnett, 2001).

Unexpectedly, Social Consensus did not directly influence the decision-making process, although it has been shown to be one of the most influential components of moral intensity (Barnett, 2001). Social Consensus might not be influential in the specific context of climate-friendly food choices, since no clear consensus exists on the effects of climate change. In addition, Social Consensus was found to interact with Proximity dimension, suggesting that the role of Social Consensus was important when the effects

of climate change were perceived as distant. These findings are not surprising, because previous climate change studies have found that there is a strong social disagreement between the public and scientists as well as between divergent groups of people, such as political groups (Dunlap & McCright, 2008; Nisbet & Myers, 2007; Oreskes, 2004).

Since our hypotheses were only partially confirmed indicating that the Issue-Contingent model of Ethical Decision making is not necessarily the best for explaining climate-friendly food choices, we suggest that future studies should also integrate

Table 2
Means, standard deviations, and correlation coefficients of the main variables (N = 350).

Variable	Range	M	SD	α	1	2	3	4	5
1. MI: Probable Seriousness of Consequences	1–7	6.05	0.84	0.88					
2. MI: Social Consensus	1–7	3.70	0.98	0.70	ns				
3. MI: Proximity	1–7	4.77	1.25	0.67	.51***	ns			
4. Moral evaluation	1–7	6.53	0.93		.34***	.12*	.20***		
5. Intention	1–7	5.13	1.57	0.92	.48***	ns	.40***	.22***	
6. Climate-friendly food choices	1–7	4.26	1.61	0.90	.48**	ns	.40***	.24***	.80***

Note: MI = Moral intensity dimension.

Table 5
Summary of hierarchical regression analysis for variables predicting the intention to make climate-friendly food choices.

Variable	B	SE B	β	R^2
Step 1				
Moral evaluation	0.39	0.09	.23[***]	
				.05[***]
Step 2				
Moral evaluation	0.12	0.08	.07	
MI: Probable seriousness of consequences	0.66	0.11	.35[***]	
MI: Social Consensus	0.06	0.08	.04	
MI: Proximity	0.25	0.07	.20[***]	
				.27[***]

Note: MI = Moral intensity dimension.
[*] $p < .05$.
[**] $p < .01$.
[***] $p < .001$.

Table 6
Summary of hierarchical regression analysis for variables predicting climate-friendly food choices.

Variable	B	SE B	β	R^2
Step 1				
Intention	0.83	0.03	.81[***]	
				.65[***]
Step 2				
Intention	0.76	0.04	.74[***]	
MI: Probable seriousness of consequences	0.20	0.08	.10[*]	
MI: Social Consensus	−0.04	0.05	−.02	
MI: Proximity	0.07	0.05	.06	
				.66[***]

Note: MI = Moral intensity dimension.
[*] $p < .05$.
[**] $p < .01$.
[***] $p < .001$.

factors other than moral perceptions. For example, previous theories and findings related to climate-friendly behavior (e.g. Lorenzoni et al., 2007), food choice motives (e.g. Steptoe, Pollard, & Wardle, 1995) and behavioral intentions (e.g. Ajzen, 1985) could be useful for building a broader model of climate-friendly food choices. In particular, the Theory of Planned Behavior (Ajzen, 1985) that has successfully been used to explain individuals' food choices includes the dimension of "perceived behavioral control" which could be integrated into the Issue-Contingent Model of Ethical Decision-making. Otherwise these two models (Theory of Planned Behavior and Issue-Contingent Model of Ethical Decision Making) are already conceptually very close: both models, for example, include the dimensions of "normative beliefs," "probable seriousness," "social consensus" and "intention." Moreover, the Issue-Contingent Model of Ethical Decision Making by Jones (1991) includes mainly cognitive elements, whereas current research on moral decision-making suggests that moral emotions and intuitions are more important than cognitive moral reasoning, which appears to be a rather secondary post hoc rationalization (Graham et al., 2011). Consequently, we suggest that in the context of moral food choices, it may be important to integrate both cognitive and intuitive elements of decision-making.

The sample for the current study consisted of university students and cannot be considered a representative sample of Finns. This feature can be considered a main limitation of the study. However, although student samples generally do not correspond to nationally representative adult samples, they have been shown to reflect the basic structural characteristics of a country (Flere & Lavric, 2008; Straus, 2009). So the manner in which theoretical constructs relate to one another should be relatively robust across different subpopulations, including university students. On the one hand, we suggest that our sample is likely to have a more positive attitude toward climate change than would a representative national sample, since more educated and younger individuals have been shown to express stronger environmental concerns than less well educated and older individuals (e.g., Dietz, Stern, & Guagano, 1998; Dunlap, Van Liere, Mertig, & Jones, 2000). However, further research is needed to understand better the motives for climate-friendly food choices in divergent cultural and social contexts.

Another limitation of the study concerns a social desirability bias, which refers to the general tendency of individuals to present themselves in a way that makes them look positive with regard to socially accepted standards. It has been suggested that a social desirability bias is more critical in studies of sensitive issues than in those examining rather neutral issues, and it has been shown that a social desirability bias is highest when the behavior studied is socially unacceptable or undesirable (Chung & Monroe, 2003). Although the current study focused on socially acceptable behavior and we did not control for a social desirability bias, it is likely that there is some social desirability bias here. In practice, this means that participants may have reported more climate-friendly food choices than they actually made. Consequently, we suggest that a social desirability bias should be taken into account, especially in future studies examining the interconnections between food and morality, since both issues can be interpreted as very sensitive topics.

Despite the limitations, we suggest that the results of the current study can be used to promote climate-friendly food choices in at least four ways. First of all, our results suggest that increasing the recognition of climate change as a moral imperative can be a useful strategy. Markowitz and Shariff (2012) have proposed six psychological strategies that can be used to bolster recognition of climate change as a moral imperative: 1. Framing climate changes with multiple moral frames. 2. Focusing on the costs of climate change. 3. Motivating action through appeals to hope, pride, and gratitude. 4. Highlighting intrinsic motives for action. 5. Increasing identification and empathy with future generations and people living in other places. 6. Highlighting positive social norms.

The second way to increase the moral intensity of climate change could be to increase the Social Consensus on climate change. In the current study, Social Consensus was low and did not predict moral decision-making directly, although in previous studies, it has been one of the most influential moral intensity dimensions with the largest effect on the moral decision-making process (e.g., Barnett, 2001). We assume that if Social Consensus had been higher, then the total moral intensity of climate change would have been higher, and consequently, the effect of moral intensity of climate-friendly food choice intentions and actions would have been stronger. Accordingly, we suggest that one of the key ways to promote climate-friendly food choices could be to increase Social Consensus on climate change. Since the public has a false view of the scientific consensus on climate change (Oreskes, 2004), special attention should be placed on the consensual aspects of information, not on disagreements. This could balance the media information, which often seems to focus on disagreement and disputes rather than on the consensual aspects of climate change.

Thirdly, since the Probable Seriousness of Consequences and Proximity predicted the intention to make climate-friendly food choices, we suggest that these dimensions should be highlighted in public communications. For example, news reporters could emphasize that climate change is occurring close to us and that it has already had an effect on food production in Northern Europe.

However, it is well known that food choices are influenced by multiple factors, such as taste, health, price, or convenience, which have been shown to be more relevant than ethical or environmental

motives (Lindeman & Väänänen, 2000; Renner, Sproesser, Strohbach, & Schupp, 2012; Steptoe et al., 1995; van't Riet et al., 2011; Tobler, Visschers, & Siegrist, 2011a). We suggest that in situations in which the more relevant food choice motives such as taste and health are activated, the environmental option that is perceived as unhealthy or non-tasty is not likely to be selected. Taking into account the limited role of environmental and ethical motives in food choice, we suggest that a fourth way of promoting climate-friendly food choices would be to integrate non-environmental and non-ethical food choice motives into environmental ones because motives involving eating are more or less closely related (Renner et al., 2012). Moreover, ecological food consumption also has non-environmental benefits, such as health benefits, which together might be more convincing to consumers than environmental motives alone (Tobler et al., 2011a). In practice, we propose that eating less meat could be presented not only as a climate-friendly choice, but also as a health-conscious choice, since health concerns may be important additional incentives for reducing meat consumption (Stehfest et al., 2009). The preference for seasonal foods could be supported by the argument for better taste (Tobler et al., 2011a), and limiting food waste could be presented as a cost- effective measure. In addition, the preference for local food could be promoted by highlighting the economic benefits for the local community, not just the climate aspects. This could be an especially effective strategy in the Finnish context; Finnish food is highly respected and even considered a moral right (Mäkiniemi, Pirttilä-Backman, & Pieri, 2011). Moreover, it has been suggested that one way to reduce food waste is to re-evaluate the current quality standards of food (Garnett, 2007). In practice, this means that consumers could be encouraged not only to consult the dates on food packages, but also to assess for themselves the freshness of the food.

We have focused on strategies to encourage individuals to make more climate-friendly food choices. However, changes at the societal level are also needed. As an example, food suppliers and food marketers could focus on increasing the availability and labeling of climate-friendly products, and environmental taxation could be an effective way to promote environmental food consumption (Vinnari & Tapio, 2012). Finally, opinion leaders and policymakers could bolster climate change as a moral imperative more effectively.

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