

Research Report

Risks of meat: the relative impact of cognitive, affective and moral concerns

Mariëtte Berndsen^{a,*}, Joop van der Pligt^b

^aDepartment of Social Psychology, University of Amsterdam/Flinders University, School of Psychology, G.P.O. Box 2100, Adelaide, SA 5001, Australia

^bDepartment of Social Psychology, University of Amsterdam, Roetersstraat 15, 1018 WB, Amsterdam, The Netherlands

Received 4 May 2004; revised 14 July 2004; accepted 29 October 2004

Abstract

The purpose of the present research was, first, to examine the impact of particular perspectives (Study 1: cognitive and affective; Study 2: moral) on the perception and acceptance of risks associated with meat consumption, and intention to reduce meat consumption in the future. The first study showed that an affective focus generally had a stronger impact on risk perception and acceptance, and intention to reduce meat consumption, than a more cognitive focus. Moreover, moral considerations had a clear impact in all conditions. Results of a second study confirmed that a moral focus has powerful effects on all the dependent variables. The second purpose of the research was to examine the perseverance of the impact of cognitive, affective and moral perspectives. In both studies, a follow-up after three weeks showed increased perception of moral risks and a strong intention to reduce future meat consumption. Moreover, attitude towards meat consumption became less positive in the conditions with an affective and moral focus. There were also significant relations between intention to reduce meat consumption, actual reduction, and intention to adhere to this level in the future. Overall, risk acceptance was mediated by perceived health and moral risks, whereas intention about meat consumption was mediated by risk acceptance.

© 2004 Elsevier Ltd. All rights reserved.

Keywords: Meat consumption; Personal health risks; Moral risks; Cognitive focus; Affective focus; Moral focus; Judgments of risk; Attitude and behavioural change

General introduction

Recently, a number of studies have addressed attitudes towards meat and the consumption of meat. This interest in meat can be related to a series of meat crises and scandals in the mid 1990s such as BSE, foot and mouth disease, and illegal hormones in beef (see, for example: Pennings, Wansink, & Meulenberg, 2001; Povey, Wellens, & Conner, 2001). More recent examples include classical swine fever virus, salmonella and aviatic influenza in chicken. It could well be that all these events have increased public doubts about the risks and benefits of meat consumption. Even before these crises, studies on meat consumption showed that people had doubts about eating meat due to health-related consequences, and to moral concerns such as killing

animals and negative consequences for the environment. (Beardsworth & Keil, 1991; Povey et al., 2001; Santos & Booth, 1996).

For a long time research on risk perception and risk acceptance focused primarily on cognitive determinants. More recent research also addressed the role of emotions, and in particular regret (see Van der Pligt, 2002 for an overview). Decision makers became more risk averse when they anticipated the experience of regret as a consequence of their decision (e.g. Josephs, Larrick, Steele, & Nisbett, 1992; Richard, Van der Pligt, & De Vries, 1996; Zeelenberg, Beattie, Van der Pligt, & De Vries, 1996). With respect to other emotions, Lerner and Keltner (2001) found that risk estimates of fearful people are pessimistic and that they tend to make more risk-averse choices, whereas angry people expressed more optimistic risk estimates and opted for more risk-seeking choices. Raghunathan and Pham (1999) showed that sad people prefer high risk, high reward options, whereas anxious people choose low risk,

* Corresponding author.

E-mail address: mariette.berndsen@flinders.edu.au (M. Berndsen).

low reward options. Thus, like cognitions, emotions can affect people's risk behaviour.

Finucane, Alhakami, Slovic, and Johnson (2000) suggested that people rely on an 'affect heuristic' when judging risks. These researchers found that risk perceptions and behaviour are highly influenced by affect. They concentrated primarily on the interplay between affect and cognition in decision making and assumed that affect can provide helpful information about the best behavioural reaction. Loewenstein, Weber, Hsee, and Welch (2001) demonstrated that this is not always the case. They put forward the 'risk-as-feelings-hypothesis' which posits that people can display behaviour which deviates from what they consider the best reaction. In other words, emotional reactions to a risky situation can conflict with cognitive evaluations of risk severity. For example, people can suffer strong fears about airplane crashes even though they know that such a hazard is highly unlikely to occur. In such cases emotions are likely to control one's behaviour.

The purpose of the present research was to assess the relative impact of cognitions versus affect on perceptions of risk associated with meat consumption. We activated either a cognitive focus or a more affective focus in accordance with the procedure of Higgins (1996). Higgins has shown that knowledge that is most accessible will be used to interpret stimulus information. For example, Higgins, Rholes, and Jones (1977) presented their participants with a task in which they were exposed to particular traits. In one condition participants were exposed to synonyms of the trait 'reckless' and participants in the other condition were exposed to synonyms of 'adventurous'. Thereafter, participants read a relatively ambiguous description of a person's behaviour that could be interpreted as either reckless or adventurous. Higgins et al. found that participants who were exposed to the reckless traits perceived the person as more reckless, whereas participants who were exposed to the adventurous traits perceived the person as more adventurous. Taken together, activated knowledge affects our judgments when that knowledge is related to the stimulus information. Thus we expected that activated (cognitive or affective) information about meat consumption will be applied to subsequent judgments about the consumption of meat. To be more specific, we investigated how focus affects the perception and acceptability of risks associated with eating meat, and intentions about meat consumption in the future.

In the context of meat consumption some research has distinguished between health risks and more moral considerations. Manstead (2000) argued that theories on moral development (Hoffman, 1983, chap. 9; Kohlberg, 1984) generally assume that moral concerns develop from the ability to put oneself in someone else's position, and take account of this perspective. Moreover, Oswald (1996) distinguished between cognitive perspective taking (understanding what the other person is thinking) and affective perspective taking (experiencing what the other person is

feeling). In other words, moral concerns can arise from both cognitive and affective perspective taking and involve a concern for the welfare of others. Borgmann (2000), for example, reported moral considerations such as environmental damage and lack of interest in the security and expansion of future consumer goods. In the present paper, we term the moral concerns 'moral risks'.

There are also researchers who have argued that moral judgment is primarily a matter of emotions and affect (Green & Haidt, 2002; Irwin & Baron, 2001). For example, according to Irwin and Baron decisions involving moral values can increase the intensity of emotions. Some researchers even argue that emotions are to a large extent moral judgments about events in the world (e.g. Solomon, 1976). Even though emotions appear to be intertwined with moral judgments, it seems still worthwhile to distinguish between the two because people can anticipate emotions without moral reflections (Manstead, 2000).

Sparks and Shepherd (2002) investigated the role of moral judgments in the domain of food. They showed that moral norm had independent effects on behavioural intentions (see also Gorsuch & Ortberg, 1983; Parker, Manstead, & Stradling, 1995), and also that moral judgments may affect attitudes. In their first study participants commented on their own moral judgments involving buying pork produced with a genetically engineered growth hormone. The most frequently mentioned issue was animal health/welfare, including the welfare of future generations. These moral concerns have also been found in research on ambivalence toward meat consumption; Berndsen and Van der Pligt (2004) showed that moral and affective aspects were the prime predictors of ambivalence with regard to meat consumption.

In the present research we addressed perceptions of personal health and moral risks associated with meat consumption. Personal health risks of meat consumption are described in either cognitive or affective terms. Based on the work of Higgins et al. (1977) described above, the first purpose of this study was to investigate whether exposure to cognitive or affective stimulus information would affect perceptions of health risks. We did this by comparing these risk perceptions to those in a control group in which we did not activate a specific focus. In addition, we also examined risk acceptance and intentions about future meat consumption. The second purpose of this study was to examine the relative stability of perseverance of the cognitive and affective foci over a time span of three weeks. More specifically, we assessed the stability in attitude towards meat consumption, risk perception and acceptance, level of meat consumption, and future plans involving meat consumption. The second study in which we activated a moral focus aimed to replicate and extend these findings.

In sum, we investigated the effects of different foci on judgments of risk, and behaviour involving the consumption

of meat. The different foci were created by manipulating the stimulus information provided to participants.¹

Study 1

Introduction

The first study addressed the relative impact of a cognitive versus affective focus when judging risks concerning the consumption of meat. We designed messages which were expected to give rise to a cognitive or an affective focus, while there was no message for the control condition. Due to these messages, we expected higher perceptions of personal health risk in both the cognitive and affective condition as compared to the control condition because the risks are associated with both cognitive and affective aspects (prediction 1). As a consequence of higher risk perceptions, the acceptability of risks involving meat consumption was expected to be lower in the cognitive and affective conditions than in the control condition (prediction 2). Based on these two predictions (increased risk perception and decreased risk acceptance), we expected that participants in the cognitive and affective conditions would be more likely to intend to reduce future meat consumption than participants in the control condition do (prediction 3). We also examined whether focus affects perceptions of moral risks. Finally, in a follow-up study three weeks later we explored the durability of the cognitive and affective arguments on judging risks of meat consumption and actual meat consumption in the past weeks.

Method

Participants and design

A total of 141 psychology students (83 female, 58 male, mean age 20.2 years) at the University of Amsterdam participated in the study for course credit. Participants were seated behind a personal computer. The repeated measure design consisted of one between-subjects factor; focus on risks of meat consumption ('cognitive', $n = 50$; 'affective', $n = 53$; 'no focus', $n = 38$).

Stimulus materials and procedure before manipulation

All participants were asked to answer a few items before the actual manipulation took place:

Attitude. Six semantic differential scales measured respondents' attitude towards meat. The six items were 1 (against) to 9 (for), 1 (unpleasant) to 9 (pleasant), 1 (bad) to

9 (good), 1 (unfavorable) to 9 (favorable), 1 (tasteless) to 9 (tasty), 1 (negative) to 9 (positive). Cronbach's alpha was 0.90. An overall attitude score was computed by taking the mean of the six items so that it ranged from 1 to 9, with higher ratings indicating a more positive attitude.

Self-reported current behaviour. Participants were asked to indicate how many days a week they eat meat at dinner. They were also required to indicate the weight of the meat per meal (less than 100 g, 100–200 g, 200–300 g, more than 300 g). The ratio of days to week was multiplied with the weight score, resulting in a score ranging from 0 to about 350 g a day. For example, a respondent indicated to eat meat three days a week, with an average weight between 100 and 200 g. We then multiplied 3/7 (days/week) with 150 (midpoint of 100–200 g), yielding a score of 64.3 g of meat consumption a day. In addition to dinner, participants were asked whether they consumed other meat products in lunch dishes and snacks. They were asked to indicate the weight of these meat products per day in similar categories as used for meat with dinner. This score was added to the first one, yielding an index of meat consumption, ranging from 0 to about 700 g a day.

Self-reported knowledge of risks. Participants indicated how well they were informed about the risks of meat consumption, on a scale ranging from 1 (not at all) to 9 (very well).

Manipulation

Next, the manipulation of message focus followed. Participants in the experimental conditions were presented with an article about risks of meat consumption. We constructed the article and told participants that it was a summary of an extensive article published in a well-known Dutch newspaper. The article in the cognitive condition described risks of meat consumption in more cognitive terms, whereas the article in the affect condition described these risks in more affective terms. The bold words in the scenarios show the manipulation of cognitive versus affective focus. Participants in the cognitive condition read the following article:

"It is well known that meat (particularly hamburgers and pork) can increase cholesterol levels, which in turn increases **the prevalence of** heart and vascular diseases, such as strokes and heart attacks. In the Netherlands there is limited control about the quality of meat, and experts have modest knowledge about possible risks associated with meat consumption. As a consequence, there have been several meat crises: BSE, foot and mouth disease, illegal hormones in beef, to give a few examples. **The consumption** of meat contaminated with BSE can cause neurological damage, which can even result in death. Furthermore, **it is likely that** consuming meat that contains hormones is harmful for one's health. In sum, it can be risky to continue the consumption of meat".

¹ Having this goal in mind, we believe that an experimental design is the most appropriate method here. This is not to say that other research methods such as a survey are unsuitable to address this research question. However, a survey can establish correlational relationships between variables (for instance, 'an affective perspective is associated with increased perceptions of health risk'), whereas we are interested in what causes that relationship.

Participants in the affect condition read the following article:

“It is well known that meat (particularly hamburgers and pork) can increase cholesterol levels, which in turn increases **anxiety about** heart and vascular diseases, such as strokes and heart attacks. In the Netherlands there is limited control about the quality of meat, and experts have modest knowledge about possible risks associated with meat consumption. As a consequence, there have been several meat crises: BSE, foot and mouth disease, illegal hormones in beef, to give a few examples. **People fear that the consumption** of meat contaminated with BSE can cause neurological damage, which can even result in death. Furthermore, **people are concerned about the consumption of** meat that contains hormones, because it can be harmful for one’s health. In sum, it can be risky to continue the consumption of meat”.

Stimulus materials and procedure after the focus manipulation: time 1

Message focus. Perceived message focus was assessed by three items. (1) How much does the article convince you, (2) do you agree with the content, (3) how informative was the article for you. The scores on the three items could vary from 1 (not at all) to 9 (extremely). Cronbach’s $\alpha = 0.73$, and one overall focus score was computed by taking the mean of the three items which could range 1–9, with higher ratings indicating increased message focus.

Risk perception was measured by nine items. Six items described personal health-related risks: ‘eating meat (a) is risky for my health, (b) has very limited personal risks, (c) produces personal health risks on the long-term’, ‘I feel (d) uncertain to consume meat because of the risks, (e) worried to eat meat because of the risks, (f) secure about eating meat because there are no risks’. After recoding the items b and f, Cronbach’s α for the six items is 0.86. The first three items describe risks in primarily cognitive terms (Cronbach’s $\alpha = 0.74$), whereas the latter three items describe risks in terms of affect (Cronbach’s $\alpha = 0.78$). Finally, three items described moral risks: ‘(a) meat production is non-noxious for the environment, (b) people are not entitled to kill animals, (c) eating meat is also bad for the health of future generations’ (after recoding item a, Cronbach’s $\alpha = 0.73$). The nine items were presented in random order, and respondents evaluated them on a scale anchored by 1 (fully disagree) to 9 (fully agree). Full agreement with the described risks implies perceptions of high levels of risk, whereas full disagreement refers to perceptions of zero risk. We therefore computed one score varying from 1 (no risk at all) to 9 (very risky) for the six items describing personal health risks. We also computed one score varying from 1 (no risk at all) to 9 (very risky) for the three items describing moral risks.

Acceptability of risks was assessed by two items. The first was ‘risks associated with meat consumption are lower

than most people think’. The second item was ‘eating meat has acceptable risks’. Respondents evaluated these items on a scale anchored by 1 (fully disagree) to 9 (fully agree). After recoding the first item, Cronbach’s α for the items is 0.58.

Intention to reduce meat consumption. Participants were asked to indicate whether they intended to reduce their meat consumption in the next three weeks on a scale varying from 1 (fully disagree) to 9 (fully agree).

Stimulus materials and procedure: time 2

All participants were approached again three weeks later. Some items presented to the participants were derived from the first study: (1) six items measuring attitude, Cronbach’s α is 0.95. (2) Six items involving perception of personal health risks (Cronbach’s α is 0.84) and three items involving moral risks (Cronbach’s α is 0.61). (3) Two items about acceptability of risks (Cronbach’s α is 0.74). The final two questions differed from the first study. Here, we wished to assess both whether participants carried out their intention to reduce meat consumption as indicated on the first measure and their plans for the future. Participants were asked (4) whether they had consumed less meat in the past three weeks, and (5) whether they intend to adhere to a reduced level of meat consumption in the future. These two items were evaluated on a scale anchored by 1 (fully disagree) to 9 (fully agree).

Results

Initial differences

First, we assessed whether there were differences between the three conditions before the manipulation took place. Eleven participants reported to abstain from eating meat and were excluded from the analyses. There was no significant effect of condition on attitude, $F(2,138) = 0.28$, ns, indicating that the three conditions did not differ with regard to their initial attitude toward meat consumption. With respect to actual meat consumption, we did not find significant differences between the conditions, $F(2,136) = 0.30$, ns. Respondents in the cognitive condition consumed 100.71 g of meat a day, in the affective condition, they reported to consume 108.14 g a day, and participants in the control condition consumed 103 g a day. Furthermore, the participants in three conditions did not significantly differ in their self-reported knowledge about risks involving meat consumption, $F(2,136) = 1.20$, ns. Participants reported to be moderately aware of these risks, cognitive condition: $M = 5.36$; affective condition: $M = 4.96$; control condition: $M = 5.61$. Finally, we assessed the perceived strength of the manipulated cognitive and affective message (message focus) involving risks associated with meat consumption, and we found no significant differences, $t(101) = 0.15$, ns (cognitive condition $M = 5.25$; affective condition: $M = 5.10$).

Differences after the manipulation

Attitude. An ANOVA on the measurement of attitude before the manipulation and at time 2, three weeks later, using ‘time’ as within-subjects factor, and condition as between-subjects factor, revealed a significant main effect of the within-subjects factor, $F(1,138)=9.16, p<0.01$ and a significant interaction between this factor and condition, $F(2,138)=3.63, p<0.05$. Analysis of simple main effects revealed that the attitude of participants in the affective condition (Table 1) became significantly less positive at time 2 ($p<0.001$).

In the results reported below we refer to measurements at ‘time 1’ and ‘time 2’, which means directly after the manipulation and three weeks later, respectively.

Risk perception. We performed an ANOVA on the perceived personal health and moral risks, at time 1 and time 2, using ‘type of risk’ and ‘time’ as within-subjects factors, and condition as between-subjects factor. The analysis revealed a significant main effect of both conditions, $F(2,137)=7.98, p<0.01$, and of the within-subjects factor ‘type of risk’, $F(1,137)=51.36, p<0.001$, indicating that perceived moral risks were higher than perceived health risks. The significant interaction between these factors, $F(2,137)=5.48, p<0.01$, was due to higher ratings of perceived health risks in the affective condition (Table 1) than in the cognitive condition ($p<0.01$) and the control

condition ($p<0.001$), whereas there were no significant differences between the two latter conditions. In other words, the first prediction that perceptions of personal health risk would be more pronounced in the cognitive and affective condition than in the control condition was supported for the affective condition but not for the cognitive condition.²

The results of ANOVA showed also a significant interaction between the two within-subjects factors (type of risk and time), $F(1,137)=5.17, p<0.05$, showing that after three weeks the perception of moral risks became more prominent than perceived personal health risks (Table 1).

Acceptability. An ANOVA on risk acceptance at time 1 and time 2, using ‘time’ as within-subjects factor and condition as between-subjects factor, revealed a significant effect of condition, $F(2,138)=11.7, p<0.001$. Simple main effects showed that respondents in the affective condition were less accepting of risks associated with meat consumption (Table 1) than respondents in the cognitive condition ($p<0.05$) and in the control condition ($p<0.05$), whereas there were no significant differences between the cognitive and control conditions. Thus, the second prediction that the acceptability of risks involving meat consumption would be lower in the cognitive and affective conditions than in the control condition was supported for the affective condition but not for the cognitive condition.

Almost the same picture emerged for the repeated measure: risk acceptance was lower in the affective condition than in the cognitive condition ($p=0.05$) and in the control condition ($p<0.01$) and again, there were no significant differences between the cognitive and control conditions (Table 1).

Table 1
Mean ratings of attitude, risk perception and acceptance, and intended and actual reduction of, and future intention to reduce, meat consumption as a function of activated focus (Study 1)

	Condition		
	Affective focus	Cognitive focus	Control
Attitude			
Before manipulation	6.59	6.71	6.46
Time 2	5.31	6.15	6.50
Perception of health risks			
Time 1	4.84	4.12	3.87
Time 2	4.93	4.13	3.62
Perception of moral risks			
Time 1	4.99	4.60	4.40
Time 2	5.22	4.93	4.83
Risk acceptance			
Time 1	5.40	6.12	6.10
Time 2	4.80	5.72	6.27
Reduce meat consumption			
Intention (time 1)	3.48	2.38	3.08
Actual behaviour (time 2)	3.75	2.78	3.16
Future intention to maintain (time 2)	7.00	7.50	7.21

Note: Higher ratings indicate a more positive attitude, higher risk perception, more acceptance, stronger intention to reduce meat consumption, more actual reduction of meat consumption, and stronger intentions to maintain reduced level of meat consumption. ‘Time 1’ refers to measures direct after the manipulation and ‘time 2’ refers to measures three weeks later.

Intended and actual reduction of meat consumption

We found weak support for our third prediction that participants with a cognitive or affective focus would report stronger intentions to reduce meat consumption than respondents in the control condition would do. An ANOVA on intentions to reduce meat consumption

² The scores of perceived personal health risks at time 1 provided the opportunity to check whether the inductions of a cognitive and affective focus were successful. The first three items of health risks were phrased in cognitive terms and the latter three items in affective terms. A ONEWAY on the affective risk items revealed that condition exerted a significant effect, $F(2,138)=5.86, p<0.01$. The ratings of these risks were higher in the affective focus condition ($M=4.83$) than in the cognitive focus ($M=3.92, p<0.05$) and control condition ($M=3.66, p<0.01$). Thus, the induction of an affective focus was successful, because affective risks were more salient in the affective focus condition than in the other conditions. A corresponding ONEWAY on the ratings of personal health risks on the cognitive items revealed a marginally significant effect of condition, $F(2,138)=3.03, p=0.05$. Further analyses revealed that this effect was due to the higher risk ratings in the affective condition ($M=4.81$) than in the control condition ($M=4.08, p<0.05$). However, respondents in the cognitive condition did not perceive more risks on the cognitive items ($M=4.32$) as compared to respondents in the control condition. Thus, the induction of a cognitive focus seemed less successful.

(time 1) and the actual consumption in the past three weeks (time 2), using time as within-subjects factor and condition as between-subjects factor, revealed a significant effect of condition, $F(2,137)=3.75$, $p<0.05$. Further analyses showed that respondents in the affective condition reported that they were more likely to reduce meat consumption in the next three weeks ($p<0.05$) and fulfilled these intentions more ($p=0.07$) than respondents in the cognitive condition. The means in Table 1 show that these intentions and actual reduction of meat consumption are relatively low. There were no significant differences between the cognitive and control condition. However, the correlation between intentions to reduce meat consumption in the next three weeks and actual reduction in this period, was significant, $r=0.51$, $p<0.001$.

Long-term intentions. The means in Table 1 show that at time 2 respondents have reasonably strong intentions to extend their diminished level of meat consumption of the past three weeks to the future. There were no significant differences between the conditions. Moreover, reduction of meat consumption in the past three weeks was significantly correlated with intentions to continue the reduced meat consumption in the future, $r=0.65$, $p<0.001$.

Mediating analyses

In order to assess if differences in risk acceptance were produced by differences in perceived risks, we performed two mediational analyses, one at time 1 and another at time 2. An ANCOVA on the ratings of risk acceptance (time 1), using both personal health and moral risks as covariates, revealed significant effects of these covariates, health risks: $F(1,136)=55.0$, $p<0.001$; moral risks: $F(1,136)=7.47$, $p<0.01$. The main effect of condition dropped below significance, $F(2,136)=1.25$. An ANCOVA at time 2 revealed a similar picture: health risks and moral risks were significant covariates, $F(1,135)=26.6$, $p<0.001$; moral risks: $F(1,135)=11.56$, $p<0.01$, respectively. The significant main effect of condition disappeared, $F(2,135)=1.66$.

Above we found a main effect of condition on intentions to reduce meat consumption and actual meat consumption in the past three weeks. It seems reasonable to assume that these effects are mediated by risk acceptance as measured at time 1. In order to examine this idea we performed an ANCOVA on intentions to reduce meat consumption and actual meat consumption, using risk acceptance as a covariate, which resulted in a significant effect of the latter, $F(1,136)=37.8$, $p<0.001$, whereas the significant effect of condition was no longer significant, $F(2,136)=1.60$.

Discussion

The purpose of the present study was to assess the impact of a cognitive versus an affective focus on perceived risks of meat consumption. We also investigated how focus affects risk acceptance and intentions to reduce future meat

consumption. We assessed the stability of attitude and risk judgments about meat consumption three weeks after the first measurement. Moreover, this provided the opportunity to investigate whether previous indicated intentions to reduce meat consumption were actually carried out.

There were no initial differences between the cognitive versus affective focus conditions in meat consumption, knowledge about risks involving meat consumption, attitude towards meat consumption. Moreover, perceived strength of the message did not differ between the cognitive and affective condition. These findings exclude alternative explanations for the observed results.

Although the strength of the message focus was experienced as similar in the cognitive and affective conditions, the effects were different. Participants in the affective condition perceived more personal health risks on the affective items than participants in the other conditions. However, a corresponding picture did not emerge for the cognitive condition in which the perceived risks on the cognitive items did not differ from those in the other conditions. Moreover, after three weeks, attitude toward meat consumption tended to become less positive in the affective condition, whereas the other conditions did not show significant differences between the attitude measures.

The first prediction that perceptions of personal health risks would be more pronounced in the cognitive and affective conditions than in the control condition was only supported for the affective condition, in which ratings of health risks were higher than in the control condition. A similar effect did not occur in the cognitive condition, which might be due to familiarity with the cognitive message.³ An interesting and challenging finding is that in all conditions perceived moral risks were higher than those of personal health risks, and also that they increased after three weeks, whereas perceived personal health risks remained relatively unchanged in that period.

The second prediction also received partial support. Acceptability of risks was lower in the affective condition than in the control condition, and we did not observe a similar effect for the cognitive condition. After three weeks, this finding was still stable. Moreover, results of mediational

³ A possible explanation for this finding is that most participants are generally aware of personal health risks described in cognitive terms. Berndsen and Van der Pligt (2003) have found some evidence for this suggestion when they asked their participants which beliefs about meat consumption were novel for them. We selected the beliefs from their study that generally correspond to the perceived risks in the present study, and we found that about 10% of their participants perceived the cognitive risk items as novel, whereas almost 25% did so for affective risk items, and about 45% reported the novelty of moral risks. Thus it is likely that message with a cognitive focus did not enhance the perception of health risks on the cognitive items words because these were already well known. In other words, the absence of significant differences between the cognitive and control conditions on all measures in this study may suggest that a cognitive focus on risks of meat consumption is the default.

analyses showed that risk acceptance was a function of perceived risks.

The third prediction that meat eaters with a particular focus are more likely to intend to reduce future meat consumption in the next three weeks than meat eaters in the control condition, received modest support. Results for the affective condition were somewhat different from our prediction. That is, meat consumers in the affective condition showed these intentions in comparison with the cognitive condition but not in comparison with the control condition. Similarly, meat consumers in the affective condition reported to consume less meat in the past three weeks as compared to consumers in the cognitive condition. When we controlled for risk acceptance, the effect of condition on both intentions for the next three weeks and the actual meat consumption in this period disappeared. Moreover, people who had intended to reduce their consumption of meat reported that they did implement that behaviour in reality and indicated that they would adhere to this in the future. In sum, the activation of an affective focus on risks of meat consumption has strong effects on perceptions of risk and acceptance. Moreover, such a focus is likely to result in a less positive attitude toward meat consumption, stable risk judgments and behaviour. Some risk judgments become more pronounced after three weeks, whereas other judgments remain unchanged. Moreover, actual meat consumption decreased somewhat during this period.

It is interesting to note that perceptions of moral risks were very pronounced in all conditions and at both times of measurement. It would therefore be interesting to generate a moral focus on risks associated with meat consumption and to examine how this affects perceptions of personal health and moral risks. This was the goal of the second study.

Study 2

Introduction

We argued above that moral judgments involve a concern for the welfare of others, including animals and future generations. In this second study we investigated how a moral focus affects risk perception and acceptance, and intention to reduce future meat consumption. In Study 1 we found higher ratings of perceived moral risks as well as increased perception of these risks after three weeks compared to personal health risks. These findings were observed regardless of a particular focus. Given the strong impact of just rating moral risks, we expected that the induction of a moral focus would have powerful effects on subsequent measures of risk perception and acceptance, and intention to reduce future meat consumption. Moreover, we expected that a focus on moral arguments would affect the durability of risk judgments and behaviour three weeks later. More specifically, we predicted that participants in the moral condition would perceive higher moral risks

compared to participants in the control condition at time 1 (prediction 1a) and that these effects would remain stable at time 2 (prediction 1b). We explored whether a moral focus has an impact on the perception of personal health risks by comparing these perceptions with those in the control condition. Because of induced moral focus, respondents in this condition would display a less positive attitude toward meat consumption as compared to respondents in the control condition at time 2 (prediction 2). Moreover, risk acceptance associated with meat consumption is expected to be lower in the moral condition than in the control condition at time 1 (prediction 3a) and this finding is expected to be stable three weeks later (prediction 3b). Due to increased risk perception and decreased risk acceptance, we predicted that respondents in the moral condition would express stronger intentions to reduce meat consumption in the next three weeks (time 1) than participants in the control condition would do (prediction 4a). We predicted also that the actual meat consumption would be lower in the moral condition than in the control condition at time 2 (prediction 4b). Finally, we expected stronger future adherence to reduced levels of meat consumption in the moral condition than in the control condition at time 2 (prediction 5).

Method

Participants and design

The participants were 92 psychology students (53 female, 39 male, mean age 20.6 years) at the University of Amsterdam who participated in this study for course credit. As in the first study, they were seated behind a personal computer. The repeated measure design consisted of one between-subjects factor, focus on risk perception ('moral focus', $n=45$; 'no focus', $n=47$).

Stimulus materials and procedure

The stimuli and procedures were the same as in the first study, except for the activation of moral focus. Participants in the moral condition were presented with an article from the same newspaper as in Study 1, but now it described moral risks associated with meat consumption. Again, we constructed the article and told participants that it was a summary of an extensive article published in a well known Dutch newspaper. They read the following article:

"For a few years animal welfare had received a lot of attention. Nevertheless, many cattle that live solely for the purpose of consumption, live under miserable conditions. Cruelty to animals increased even more during the massive destruction of cattle that was possibly contaminated with BSE or food and mouth disease. Both these diseases and the presence of illegal hormones in beef have resulted in severe meat crises. We know that the consumption of meat contaminated with BSE can cause neurological damage, which can even result in death. This disease is called Creutzfeldt–Jacob Disease

(CJD). Particularly the future of young children is in danger because CJD manifests itself in a later stage. Moreover, children would not only be victimized due to contaminated meat, but also because of transfusions with contaminated blood. This is because blood is not tested on CJD in the Netherlands. Another important problem associated with the production of meat is the manure surplus which causes serious problems for the environment. Nitrates from manure pollute drinking- and swimming-water. This has devastating consequences for the future of flora, fauna, and human health”.

As in the first study, all participants were approached three weeks later in order to examine the stability of the effects observed on the first measures.

Results

Control tests

Reliabilities. Like in the first study, we computed Cronbach's alphas for message focus, attitude, perceived personal health risks and moral risks, and acceptability of risk, which ranged from 0.74 to 0.94.

Initial differences. There were no significant differences in attitude $t(90)=0.23$, ns, nor in actual meat consumption between the moral and control conditions, $t(90)=0.11$, ns. Respondents in the moral condition reported to consume 102.86 g of meat a day, and participants in the control condition indicated to consume 101.14 g a day. With respect to knowledge about risks involving meat consumption, we did not find significant differences between the conditions, $t(90)=0.52$, ns (moral condition: $M=5.53$ and control condition: $M=5.79$).

Message focus. Participants' ratings demonstrated a reasonably strong moral focus on meat consumption ($M=6.23$ on a scale from 1 (not at all) to 9 (extremely)).

Differences after the manipulation

Risk perception. The first prediction (1a) was that participants in the moral condition would show higher moral risk perceptions as compared to respondents in the control condition at time 1, and that these effects would be stable after three weeks (prediction 1b). An ANOVA on the perceived personal health and moral risks, using 'type of risks' and 'time' as within-subjects factors, and condition as between-subjects factor, revealed a significant main effect of condition, $F(1,90)=37.0$, $p<0.001$, showing that the perception of both moral risks and health risks were higher in the moral condition than in the control condition on both measurements (Table 2). Thus, the activation of a moral focus was successful and supported predictions 1a and 1b. Besides a significant main effect of the within-subjects factor type of risk, $F(1,90)=100$, $p<0.001$, there was a significant interaction between this factor and condition, $F(1,90)=6.25$, $p<0.05$, showing that perceived moral risks were higher in the moral condition than in the control

Table 2

Mean ratings of attitude, risk perception and acceptance, and intended and actual reduction of, and future intention to reduce, meat consumption as a function of activated focus (Study 2)

	Condition	
	Moral focus	Control
Attitude		
Before manipulation	6.25	6.34
Time 2	5.33	6.23
Perception of health risks		
Time 1	4.61	3.75
Time 2	4.43	3.60
Perception of moral risks		
Time 1	6.11	4.35
Time 2	6.14	4.92
Risk acceptance		
Time 1	4.83	5.86
Time 2	4.45	6.00
Reduce meat consumption		
Intention (time 1)	3.87	2.87
Actual behaviour (time 2)	3.51	2.96
Future intention to maintain (time 2)	7.20	7.40

Note: Higher ratings indicate a more positive attitude, higher risk perception, more acceptance, stronger intention to reduce meat consumption, more actual reduction of meat consumption, and stronger intentions to maintain reduced level of meat consumption. 'Time 1' refers to measures direct after the manipulation and 'time 2' refers to measures three weeks later.

condition, whereas this difference between the conditions was less pronounced for the health risks (Table 2).

Furthermore, ANOVA revealed a marginally significant interaction between the within-subjects factors type of risks and time, $F(1,90)=3.49$, $p<0.07$, showing that after three weeks perceived moral risks increased, whereas perceived personal health risks decreased. The means (Table 2) indicate that this latter effect should be attributed to the control condition in which the perceived moral risks became more prominent, whereas they remain relatively stable in the moral condition.

We investigated also the scope of the activated moral focus on perceived personal health risks on the cognitive items (Cronbach's alpha=0.72) and the affective items (Cronbach's alpha=0.82) at time 1. It was found that a moral focus led to perceptions of both higher personal health risks on the cognitive items ($M=4.53$, $p=0.05$) and on the affective items ($M=4.70$, $p<0.01$) as compared to the control condition ($M=3.95$ and $M=3.55$, respectively).

Attitude. ANOVA revealed a significant main effect of the difference between attitude before the manipulation and three weeks later (time 2), $F(1,90)=4.72$, $p<0.05$, and a marginally significant interaction between this factor and condition, $F(1,90)=2.87$, $p=0.09$. This interaction showed that attitude became less positive in the moral condition after three weeks, $F(1,90)=7.32$, $p<0.01$, but not in the control condition (Table 2). This finding supports prediction 2.

Acceptability. We performed an ANOVA on risk acceptance at time 1 and time 2, using ‘time’ as within-subjects factor and condition as between-subjects factor. A main effect of condition showed that respondents in the moral condition were less accepting of meat related risks on both times of measurement than respondents in the control condition, $F(1,90)=33.89$, $p<0.001$ (Table 2), which supported predictions 3a and 3b. As in the first study, we performed an ANCOVA on the ratings of risk acceptability with perceived risks as covariates. At time 1, both perceived personal health risks ($F(1,88)=36.3$, $p<0.001$) and moral risks, $F(1,88)=7.34$, $p<0.01$, were significant covariates. The main effect of condition dropped below significance ($F=0.53$, ns). A different picture emerged for time 2. Again, perceived personal health risks and moral risks were significant covariates, $F(1,88)=14.7$, $p<0.001$ and $F(1,88)=9.51$, $p<0.01$, respectively. However, the main effect of condition remained significant, $F(1,88)=10.2$, $p<0.01$.

Intended and actual reduction of meat consumption. As in Study 1, the means in Table 2 show that both intention to diminish meat consumption (time 1) and the actual reduction (time 2) were relatively low. An ANOVA on intention to reduce meat consumption and the actual behavior in the past three weeks, using ‘time’ as within-subjects factor and condition as between-subjects factor, revealed a marginally significant main effect of condition, $F(1,90)=2.77$, $p<0.10$. Participants in the moral condition tended to have a stronger intention to reduce future meat consumption (prediction 4a) and they consumed less meat in the past three weeks (prediction 4b) than participants in the control condition. As in the first study, this effect of condition disappeared, $F(1,89)=0.68$, ns, when risk acceptance (as measured at time 1) was included as a covariate, $F(1,89)=6.83$, $p<0.05$. The correlation between intention to reduce meat consumption in the next three weeks and actual reduction in this period, was significant, $r=0.65$, $p<0.001$.

Long-term intentions. The respondents have a reasonably strong intention to extend their diminished level of meat consumption of the past three weeks to the future (Table 2). There were no significant differences between the conditions, indicating no support for the fifth prediction that participants in the moral condition would show a stronger long-term intention than those in the control condition would do. Moreover, meat consumption in the past three weeks was modestly correlated with intentions to continue the reduced meat consumption in the future, $r=0.23$, $p<0.05$.

Discussion

As in the first study, there were no initial differences between the conditions with respect to attitude toward meat consumption, current meat consumption, and knowledge about risks concerning the consumption of meat. Results of the second study showed that a moral focus on risks

involving meat consumption has a powerful effect on risk perception and acceptance, and a modest impact on intentions to reduce meat consumption in the short term. In accordance with the findings of the first study, we found that risk acceptance was dependent on perceived risks, whereas intentions to reduce meat consumption were dependent on risk acceptance.

We also found that a moral focus on risks associated with meat consumption augments the perception of both personal health risks on affective and cognitive items. One may argue that this effect is a result of the wordings in the message because the description of moral arguments included also affective and cognitive concerns, which may then have increased perceptions of health risks on the affective and cognitive items. However, this explanation seems not plausible for two reasons. First, the manipulation of cognitive concerns in the first study did not augment the perception of cognitive health risks. Thus, the mere presence of cognitive concerns does not necessarily lead to an increase in perceived risks on the cognitive items. Second, before we have argued that moral judgments can arise from both cognitive and affective perspective taking, which refer to take account of someone else’s position. Indeed, the description of our moral arguments covered affective and cognitive concerns with regard to the welfare of others (children, animals). However, the point to make here is the finding that such a moral focus expands to increased perceptions of personal health risks. In other words, the strength of moral arguments is that they enhance concerns for others and simultaneously influence concerns for oneself. To put it simply, what could happen to others, could also happen to us. The reverse thought seems less likely because the first study showed that the presence of a cognitive or affective focus did not result in higher perceived moral risks than the absence of a particular focus.

The observations three weeks after the first measurement are almost in line with the predictions. We found that the attitude of participants in moral condition would become less positive as compared to participants’ attitude in the control condition. The other predictions prescribing the durability of the effects obtained at the first measurement were also supported: for the moral condition, we observed indeed stable perceived moral risks, and compared to the control condition we found both decreased risk acceptance and a tendency to reduce meat consumption in the moral condition. However, and unexpectedly, we found increased perceptions of moral risks in the control condition after three weeks. The fifth prediction that adherence to reduced levels of meat consumption in the long term would be stronger in the moral condition than in the control condition, did not receive support because participants in both conditions indicated to do so. Finally, it was observed that meat consumption was mediated by risk acceptance, and in general, that participants who intended to reduce their consumption of meat, reported to implement that behaviour in reality and indicated also to adhere to this in the future.

In contrast to the first study, risk acceptance on the repeated measure was not mediated by perceived risks, which suggests that moral arguments exerted even a strong impact on risk acceptance three weeks later.

In sum, these findings show that the activation of a moral focus on risks of meat consumption, influences the initial perceptions and acceptance of risks, as well as the intention to reduce the consumption of meat in the short term. Moreover, such a moral focus endorses the stability of these effects three weeks later. However, judging risks, like in the control condition, is also likely to affect perceptions of moral risk and a future intention to decrease meat consumption.

General discussion

This research shows that both an affective (Study 1) and a moral focus (Study 2) on risks involving the consumption of meat, leads to both higher perceptions of risk and future plans to diminish meat consumption, and decreases the acceptability of risks.

Besides the effects of an affective and moral focus, both studies show that simply rating risks, as in the control conditions, leads to increased perceptions of moral risks on the second measurement. These findings are likely to result from rating (and hence thinking about) moral risks. In the first study, we found strong perceptions of moral risks independent of focus. This overall strong effect might be due to the novelty of this type of risks. Results of the follow-up measure showed that perceived moral risks became even more pronounced. The latter result was also found in the control condition of the second study.

This is not to argue that perceptions of moral risks are completely insensitive to any type of activation, because in the second study we found that the activation of a moral focus led to higher perceived moral risks (compared to the control condition). Moreover, inducing moral thoughts or considerations does not only lead to increased perceptions of moral risks, but also fans out in increased perceptions of personal health risks described in both cognitive and affective terms. In other words, focusing on moral arguments seems to have an impact on the perceptions and acceptability of other risks related to meat consumption.

All in all our findings may have both practical and theoretical implications. It is theoretically interesting to examine to what extent moral concerns capture cognitive and affective issues in order to gain a fuller understanding of the impact of moral considerations on a person's behaviour. It would be also interesting to investigate the impact of moral considerations in other domains than meat consumption. Moral considerations also seem to play an important role in the context of attitudes towards GM-food. Another example, moral concerns may draw people's attention to other environmental and health concerns such as the (moral) slogan observed on Australian buses: 'We do not inherit the

world from our parents, but we borrow it from our children'. Our results may also have practical implications. We found that information including moral concerns about the consumption of meat seems to be sufficient to initiate behavioural changes in meat consumption. This might be relevant for people who are engaged in the promotion of change in food consumption. Moral considerations are likely to play an important role in decisions to eat free range meat only, or to abstain from meat eating altogether.

Overall, results of these studies help to improve our insight into the relation between both risk perception and risk acceptance, and behaviour. Mediation analyses yielded a general picture showing that acceptability of risk is a function of perceived personal health and moral risks, whereas intentions to reduce meat consumption are mediated by risk acceptance. It is possible that the external validity of these findings is somewhat limited because our sample consists of students. On the other hand, it is worth to note that we were able to find significant differences in such a restricted sample. Moreover, we have established causal relationships between the activation of specific foci and both risk judgments and behaviour. This causal relationship can serve as a starting point for a broader survey, in which people can be invited to express their moral concerns. Replication of our results will obviously contribute to the external validity.

To conclude, the two studies highlight the role of affect, but in particular the role of moral aspects on attitude, risk judgments, and behaviour involving meat consumption. That is, the salience of a moral perspective toward risks involving meat consumption increased perceptions of personal health risks, lowered the acceptability of these risks, and augmented perceived moral risks even on the long term. Besides the prominence of a moral focus, the mere judgment of moral risks, as in the control conditions, resulted in both higher perceptions of moral risks three weeks later, and in long-term intentions to reduce meat consumption. Whether these effects are stable in the long term is a matter for future research.

Acknowledgements

This project was facilitated by a grant from the Netherlands Organisation for Health Research and Development (ZonMw).

References

- Beardsworth, A. D., & Keil, E. T. (1991). Health-related beliefs and dietary practices among vegetarians and vegans: A qualitative study. *Health Education Journal*, 50, 38–42.
- Berndsen, M., & Van der Pligt, J. Attitudes toward fish and meat. Unpublished manuscript. University of Amsterdam, The Netherlands.
- Berndsen, M., & Van der Pligt, J. (2004). Ambivalence towards meat. *Appetite*, 42, 71–78.

- Borgmann, A. (2000). The moral complexion of consumption. *Journal of Consumer Research*, 26, 418–422.
- Finucane, M., Alhakami, A., Slovic, P., & Johnson, S. M. (2000). The affect heuristic in judgments of risks and benefits. *Journal of Behavioral Decision Making*, 13, 1–17.
- Gorsuch, R. L., & Ortberg, J. (1983). Moral obligations and attitudes: Their relation to behavioral intentions. *Journal of Personality and Social Psychology*, 44, 1025–1028.
- Greene, J., & Haidt, J. (2002). How (and where) does moral judgment work? *Trends in Cognitive Science*, 12, 517–523.
- Higgins, E. T. (1996). Knowledge activation: Accessibility, applicability, and salience. In E. T. Higgins, & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 133–168). New York: Guilford Press.
- Higgins, E. T., Rholes, W. S., & Jones, C. R. (1977). Category accessibility and impression formation. *Journal of Experimental Social Psychology*, 13, 141–154.
- Hoffman, M. L. (1983). Affective and cognitive processes in moral internalization. In E. T. Higgins, D. N. Ruble, & W. Hartup (Eds.), *Social cognition and social development*. New York: Cambridge University Press.
- Irwin, J. R., & Baron, J. (2001). Response mode effects and moral values. *Organizational Behavior and Human Decision Processes*, 84, 177–197.
- Josephs, R. A., Larrick, R. P., Steele, C. M., & Nisbett, R. E. (1992). Protecting the self from the negative consequences of risky decisions. *Journal of Personality and Social Psychology*, 62, 26–37.
- Kohlberg, L. (1984). Moral stages and moralization: The cognitive-developmental approach. In L. Kohlberg (Ed.), *Essays on moral development: The psychology of moral development* (pp. 170–205). San Francisco: Harper & Row.
- Lerner, J. S., & Keltner, D. (2001). Fear, anger, and risk. *Journal of Personality and Social Psychology*, 81, 146–159.
- Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin*, 127, 267–286.
- Manstead, A. S. R. (2000). The role of moral norm in the attitude-behavior relation. In D. T. Terry, & M. A. Hogg (Eds.), *Attitudes, behavior, and social context: The role of norms and group membership* (pp. 11–30). Mahwah, NJ: Erlbaum.
- Oswald, P. A. (1996). The effects of cognitive and affective perspective taking on empathic concern and altruistic helping. *Journal of Social Psychology*, 136, 613–623.
- Parker, D., Manstead, A. S. R., & Stradling, S. G. (1995). Extending the theory of planned behaviour: The role of personal norm. *British Journal of Social Psychology*, 34, 127–138.
- Pennings, J. M. E., Wansink, B., & Meulenberg, M. T. G. (2001). A note on modeling consumer reactions to a crisis: The case of the mad cow disease. *International Journal of Research in Marketing*, 19, 91–100.
- Povey, R., Wellens, B., & Conner, M. (2001). Attitudes towards following meat, vegetarian and vegan diets: An examination of the role of ambivalence. *Appetite*, 37, 15–26.
- Raghunathan, R., & Pham, M. T. (1999). All negative moods are not equal: Motivational influences of anxiety and sadness on decision making. *Organizational Behavior and Human Decision Processes*, 79, 56–77.
- Richard, R., Van der Pligt, J., & de Vries, N. K. (1996). Anticipated regret and time perspective: Changing sexual risk-taking behavior. *Journal of Behavioral Decision Making*, 9, 185–199.
- Santos, M. L. S., & Booth, D. A. (1996). Influences on meat avoidance among British Students. *Appetite*, 27, 197–205.
- Solomon, R. C. (1976). *The passions*. Berkeley: University of California Press.
- Sparks, P., & Sheperd, R. (2002). The role of moral judgments within expectancy-value-based attitude-behavior models. *Ethics & Behavior*, 12, 299–321.
- Van der Pligt, J. (2002). Cognition and affect in risk perception and risky decision-making. In C. von Hofsten, & L. Bäckman, *Psychology at the turn of the millennium. Social, developmental and clinical perspectives* (Vol. 2) (pp. 247–270). Hove, UK: Psychology Press.
- Zeelenberg, M., Beattie, J., Van der Pligt, J., & De Vries, N. K. (1996). Consequences of regret aversion: Effects of expected feedback on risky decision making. *Organizational Behavior and Human Decision Processes*, 65, 148–158.