

Provided for non-commercial research and education use.  
Not for reproduction, distribution or commercial use.



Volume 25, No. 4 ISSN 0167-8116  
December 2008

International Journal of  
**Research in Marketing**  
Official Journal of the European Marketing Academy

ELSEVIER

MSI  
Marketing Science Institute

**CONTENTS**

MSI/JRM Special Issue: Marketing and Health  
Editor: S. Stremersch

S. Stremersch, Health and marketing: The emergence of a new field of research	229
S.T.M. Kremer, T.H.A. Bijmolt, P.S.H. Leeftang and J.E. Wieringa, Generalizations on the effectiveness of pharmaceutical promotional expenditures	234
J. Gonzalez, C. Sismeiro, S. Dutta and P. Stern, Can branded drugs benefit from generic entry? The role of detailing and price in switching to non-bioequivalent molecules	247
R. Grewal, A. Chakravarty, M. Ding and J. Liechty, Counting chickens before the eggs hatch: Associating new product development portfolios with shareholder expectations in the pharmaceutical sector	261
S. Wuyts and S. Dutta, Licensing exchange—Insights from the biopharmaceutical industry	273
D. Vakratsas and C. Kolaric, A dual-market diffusion model for a new prescription pharmaceutical	282
R. Govind, R. Chatterjee and V. Mittal, Timely access to health care: Customer-focused resource allocation in a hospital network	294

*(Contents continued on back cover)*

This article appeared in a journal published by Elsevier. The attached copy is furnished to the author for internal non-commercial research and education use, including for instruction at the authors institution and sharing with colleagues.

Other uses, including reproduction and distribution, or selling or licensing copies, or posting to personal, institutional or third party websites are prohibited.

In most cases authors are permitted to post their version of the article (e.g. in Word or Tex form) to their personal website or institutional repository. Authors requiring further information regarding Elsevier's archiving and manuscript policies are encouraged to visit:

<http://www.elsevier.com/copyright>



Contents lists available at ScienceDirect

## Intern. J. of Research in Marketing

journal homepage: [www.elsevier.com/locate/ijresmar](http://www.elsevier.com/locate/ijresmar)

## Risk perception and risk avoidance: The role of cultural identity and personal relevance

Sergio W. Carvalho<sup>a,\*</sup>, Lauren G. Block<sup>b</sup>, Subramanian Sivaramakrishnan<sup>a</sup>,  
Rajesh V. Manchanda<sup>a</sup>, Chrissy Mitakakis<sup>b</sup>

<sup>a</sup> Asper School of Business, University of Manitoba, Canada

<sup>b</sup> Zicklin School of Business, Baruch College, CUNY, United States

### ARTICLE INFO

#### Article history:

First received in September 3, 2007 and was under review for 2 months

Area Editor: Priya Raghurir

### ABSTRACT

With allegations of food contamination rapidly increasing, people face numerous consumption decisions regarding food safety. This paper examines the roles of cultural similarity and personal relevance in consumers' perceptions of the risk of food-borne contamination and their intentions to reduce consumption of this food. We demonstrate that consumers are more concerned by the threat of a likely food-borne illness if the contamination occurred in a culturally similar location, regardless of physical or geographical proximity to the consumer. However, when the event is highly personally relevant, consumers feel threatened, which leads to message denial and a reversal of the facilitating effects of cultural similarity.

© 2008 Elsevier B.V. All rights reserved.

### 1. Introduction

The dawn of the 21st century has undoubtedly brought about a new wave of threats on a global scale. With allegations of tainted beef and shellfish, mercury in fish, and toxic ingredients in other consumable products, people face a host of new consumption decisions regarding their personal food safety. With such risks affecting people in large proportions, health behavior research in general, and food-health behavior research in particular, has become crucial. Nevertheless, previous studies have demonstrated that getting people to engage in behaviors to prevent or avoid potential risks to their health has often been a challenge (e.g., Weinstein, 1993). It has been found that people will not engage in preventive behaviors until they feel a risk is imminent (Luce & Kahn, 1999; Weinstein, 1993), or until they acknowledge their susceptibility and vulnerability to the threat (Brewer et al., 2007). Previous research has examined a wide variety of factors that influence feelings of personal relevance to risk and has been successful in identifying key elements that lead to heightened perceptions of vulnerability (Agrawal, Menon, & Aaker, 2007; Menon, Block, & Ramanathan, 2002; Raghurir & Menon, 1998; Sen, 2004). However, in an age of worldwide interconnectedness, examining variables that can influence people's risk judgments and that are diffuse across national lines is becoming increasingly important. This paper examines the role of one such factor, namely that of cultural

identification, and the various implications it can have on perceptions of risk and intentions to engage in preventive behavior.

In our research, conducted across three experimental studies, we demonstrate that greater perceived cultural similarity, or a feeling of "oneness" with another culture, increases perceptions of risk due to food-borne contamination, which leads to greater intentions to reduce consumption of potentially contaminated food. In Study 1, we find that perceived cultural similarity increases people's risk perceptions when the risk of food contamination is high, but does not have an effect on people's risk perceptions when the event is less likely to happen. In Studies 2 and 3, we extend our findings to examine how personal relevance, or the importance of the topic to the individual, moderates these effects by generating defensive message processing. More specifically, we are able to illustrate that the presence of a more personally relevant aspect of one's identity results in a reversal of the sole effects of cultural similarity.

### 2. Conceptual framework

Perceived risk, defined as the personal belief that one can be potentially harmed, remains a central construct in health behavior research (Brewer et al., 2007; Kuttschreuter, 2006). Risk perceptions often depend on consumers' interpretations of the situation at hand (Pennings, Wansink, & Meulenberg, 2002). Additionally, researchers have also found that perceived risk affects people's risk attitudes, which in turn determines their behavioral intentions toward that risk (Brewer et al., 2007; Pennings et al., 2002). The original predominant rational models of health behavior (e.g., the health belief model, protection motivation theory, theory of reasoned action, theory of planned behavior) typically incorporate perceived risk as an explanatory variable in behavioral change as measured by ratings of vulnerability. For example, protection

\* Correspondence author. Asper School of Business, Drake Centre, University of Manitoba, Department of Marketing, Winnipeg, MB R3T 5V4, Canada. Tel.: +1 (204) 474 8878; fax: +1 (204) 474 7545.

E-mail address: [carvalho@cc.umanitoba.ca](mailto:carvalho@cc.umanitoba.ca) (S.W. Carvalho).

motivation theory posits that people will have greater intentions to adopt health recommendations the more they believe the threat is likely (“vulnerability”), the more severe the consequences (“severity”), and the more they feel the recommended action is effective (“response efficacy”) and achievable (“self-efficacy”). To account for the more irrational decision making often found in health compliance, more recent researchers have broadened the conceptualization of perceived risk beyond a deliberative and analytical assessment. For example, Reyna et al. (Reyna & Adam, 2003; Reyna & Brainerd, 1995; Reyna & Farley, 2006) suggest that people simultaneously encode multiple mental representations of their experiences from precise verbatim information to “fuzzy gist” representations, which they define as the essential meanings filtered through experience and cultural, affective, and developmental factors (Reyna & Farley, 2006). In other words, one’s evaluation of how “at-risk” he or she is can be influenced both by specific information learned as well as by fuzzy processing preference.

Research over the last few years has begun to explore the factors that influence the decision maker’s gist of a risky situation. One such important factor is perceived proximity to a risk. Recent studies suggest that perceived closeness, whether physical or psychological, can influence perceptions of risk (Teigen, 2005). Teigen’s proximity heuristic theory in the judgment of risk proposes that people utilize their “spatial, temporal, or conceptual distance” from a situation as a measure on which to base their judgments of risks and probabilities (Teigen, 2005, p. 424). In a study done by Fischhoff, Gonzales, Small, and Lerner (2003), for example, American citizens’ assessments of risk of terrorist acts were found to be correlated with their geographical proximity to the World Trade Center. The perceived closeness to the area served as a cue that greatly influenced people’s risk judgments for being involved in a terrorist attack at some point in the near future.

While physical closeness can influence people’s evaluations of their own risk, it is psychological closeness that often affects people to a greater extent (Brown, Novick, Lord, & Richards, 1992). Perceptions of psychological closeness result when people feel part of a larger in-group to which they feel similar (Teigen, 2005) and can also manifest when people identify with a distinct set of cultural standards. Research in social psychology suggests that sharing a distinct commonality, like cultural identity, produces an assimilation process through which associations like identity and psychological closeness occur (Brown et al., 1992). Such cultural affiliations “become a part of the self-concept” (Abrams, 1994, p. 473) and can lead to very powerful influences on the individual self (Brown et al., 1992).

It is generally accepted in the literature that psychological distance has several antecedents, of which cultural distance is an important one (see Trope, Liberman & Wakslak, 2007 for a review). Research on cultural distance in an international context goes back to Hofstede (1980), who argued that cultural distance between two countries is inversely related to the cultural similarity between them. Since then, several researchers have shown that perceived similarity, or lower psychological distance from another culture, leads to a feeling of “proximity” or “oneness” with that culture (e.g., Dow, 2000; Heslop, Papadopoulos & Bourke, 1998; Wang & Lamb, 1983).

Based on this prior research on risk perception and psychological closeness, we propose that perceptions of risk and intentions to engage in preventive behavior will increase if the source of the threat is seen to originate from a culturally similar place, regardless of physical or geographical proximity. For example, as we will discuss further in Study 1, we hypothesize that Canadians will have greater perceptions of risk and intentions to modify their behavior if a food source were known to be contaminated in the UK (high perceived cultural similarity) than if the contamination occurred in France (low perceived cultural similarity). However, since prior research has demonstrated that people will not engage in preventive behaviors until they feel a risk is imminent (Luce & Kahn, 1999; Weinstein, 1993) or until they otherwise acknowledge their susceptibility and vulnerability to the threat (Brewer et al., 2007), this effect will be moderated by the likelihood of the occurrence of the threat.

Thus, we propose that cultural similarity will result in heightened risk perceptions and behavioral intentions when the threat seems likely to happen. Stated formally:

**H1.** When the likelihood of occurrence of the threat is high, participants in the culturally similar condition will have:

- greater perceptions of risk, and
- greater intentions to engage in preventive behaviors than those in the culturally dissimilar condition.

When the likelihood of occurrence of the threat is low, risk perception and behavioral intentions will not vary across levels of cultural similarity.

### 3. Study 1

#### 3.1. Method and procedure

One hundred and thirty-eight Canadian citizen undergraduate students (62% male, 38% female) with a mean age of 20.5 years participated in this study in exchange for course credit. The study was run as a 2 (cultural similarity: England vs. France) × 2 (likelihood of threat occurrence: high vs. low) between-subjects design. The countries chosen to reflect perceived cultural similarity were based on results of a pretest in which England was perceived to be the country most culturally similar to Canada while France was found to be the least culturally similar ( $M_{\text{England}}=4.25$  vs.  $M_{\text{France}}=2.42$ ;  $F(1, 11)=14.95$ ,  $p<.01$ ; 1=very dissimilar, 7=very similar).

Upon entering the experimentation room, students were presented with an article that described a fictitious, potentially fatal food contamination crisis. In our study, participants were given a fictional case of dioxin-contaminated beef that had been imported into Canada. In the culturally similar condition, the contamination occurred in England, while in the culturally dissimilar condition, students were told the contamination occurred in France. Additionally, to manipulate the likelihood of the occurrence of the threat, students were told that there was a high (low) chance that the contaminated food products entered Canada. After reading the article, subjects answered survey questions measuring their risk perception, behavioral intentions, and several demographic variables (e.g., age, gender, citizenship). Participants were thoroughly debriefed on the actual purpose of the study.

#### 3.1.1. Dependent measures

After reading the article, students indicated their perceptions of risk on a seven-point scale (1=no risk at all, 7=great deal of risk). Behavioral intentions were measured with three seven-point Likert-scaled items—“The article was influential in persuading me not to eat beef and milk products for a while,” “I should not eat beef and milk products for a while,” and “I will try not to eat beef and milk products until I find out more about the dioxin risk.” These three items were averaged and used as a behavioral intention measure (Cronbach’s  $\alpha=.90$ ).

#### 3.1.2. Covariates

Previous literature has found that trust in government can influence people’s perceptions and reactions to issues of food safety (de Jonge et al., 2004; Houghton, van Kleef, Rowe, & Frewer, 2006; Kuttischreuter, 2006). Thus, participants’ trust in the manipulated countries’ governments (England and France) was measured. The measures included two seven-point Likert-scaled items that asked participants to indicate how much they agreed with the statements “I think the English (French) government generally does what is right in order to protect its citizens,” and “I think the English (French) government does all that it can to protect its citizens.” The average of these two items comprised the trust in government measure ( $r=.87$ ).

#### 3.1.3. Manipulation checks

At the end of the questionnaire we asked participants to mention the extent to which they felt similar to people from England and people

**Table 1**  
Study 1: estimated means and standard errors

Effect	Perceived risk		Behavioral intentions		Likelihood of threat occurrence		Cultural similarity	
	M	(SE)	M	(SE)	M	(SE)	M	(SE)
Low likelihood of threat occurrence								
Culturally dissimilar (France)	2.87 <sub>a</sub>	.229	2.25 <sub>a</sub>	.226	2.42 <sub>a</sub>	.240	3.18 <sub>a</sub>	.273
Culturally similar (England)	2.48 <sub>a**</sub>	.239	2.07 <sub>a</sub>	.236	2.69 <sub>a</sub>	.254	3.83 <sub>a</sub>	.285
High likelihood of threat occurrence								
Culturally dissimilar (France)	2.81 <sub>a</sub>	.248	2.13 <sub>a</sub>	.245	2.09 <sub>a*</sub>	.250	2.86 <sub>a</sub>	.290
Culturally similar (England)	3.62 <sub>b</sub>	.226	2.87 <sub>b</sub>	.223	3.12 <sub>b</sub>	.236	3.55 <sub>a</sub>	.269

Note. Cell means within columns with different subscripts differ at  $p < .05$ . \*differ at  $p < .01$ . \*\*differ at  $p < .001$ .

from France on a seven-point scale (1=very dissimilar, 7=extremely similar). To check the risk likelihood manipulation, participants were asked about the likelihood of the average Canadian consuming dioxin-contaminated beef or milk products (1=not at all, 7=a great deal).

### 3.2. Results

#### 3.2.1. Manipulation check

To test for the likelihood of threat occurrence manipulation, we conducted a 2 (cultural similarity: England vs. France) × 2 (likelihood of threat occurrence: low vs. high) ANOVA. The results confirm a main effect of likelihood of threat occurrence such that participants rated a greater likelihood of Canadians consuming contaminated food in the high threat occurrence than in the low occurrence condition ( $M_{hi\ risk} = 2.90$  vs.  $M_{lo\ risk} = 2.25$ ;  $F(1, 133) = 6.85$ ,  $p < .01$ ). As for the cultural similarity manipulation, the results confirm a main effect of target culture such that participants perceive themselves as more similar to people in England than to people in France ( $M_{England} = 3.87$  vs.  $M_{France} = 2.85$ ;  $F(1, 134) = 37.12$ ,  $p < .001$ ). No other effects were found to be statistically significant ( $ps > .10$ ). Table 1 contains means and standard deviations for all conditions for both manipulation checks.

#### 3.2.2. Perceived risk and behavioral intentions

Analyses were conducted using a 2 (cultural similarity: England vs. France) × 2 (likelihood of threat occurrence: low vs. high) MANCOVA with trust in the government (England or France) as a covariate. As predicted in Hypothesis 1, the results revealed a significant interaction between cultural similarity and likelihood of threat occurrence in predicting participants' perception of self-risk ( $F(1, 133) = 6.40$ ,  $p < .01$ ) and intentions to temporarily stop consumption of the potentially contaminated food ( $F(1, 133) = 3.84$ ,  $p < .05$ ). Trust in government was significant such that reduced trust in the target country's government is associated with greater perceived risk and greater behavioral intentions (perceived risk:  $F(1, 133) = 5.69$ ,  $p < .05$ ,  $\beta = -2.31$ ; behavioral intentions:  $F(1, 133) = 8.90$ ,  $p < .01$ ,  $\beta = -2.86$ ). Supporting H1, simple effect tests revealed that there was a significant positive effect of cultural similarity on how much participants in the high likelihood of threat occurrence condition felt at risk ( $M_{England} = 3.62$  vs.  $M_{France} = 2.81$ ;  $F(1, 133) = 5.65$ ,  $p < .05$ ) and intended to stop consumption of the targeted food ( $M_{England} = 2.87$  vs.  $M_{France} = 2.13$ ;  $F(1, 133) = 4.83$ ,  $p < .05$ ). There was no significant effect of cultural similarity for participants in the low likelihood of threat occurrence. Perceptions of self-risk and behavioral intentions for the culturally similar condition significantly increased when the likelihood of threat occurrence was raised from low to high risk (for risk:  $M_{lo\ risk} = 2.48$  vs.  $M_{hi\ risk} = 3.62$ ,  $F(1, 133) = 11.97$ ,  $p < .001$ ; for behavioral intentions:  $M_{lo\ risk} = 2.07$  vs.  $M_{hi\ risk} = 2.87$ ;  $F(1, 133) = 6.06$ ,  $p < .05$ ). In addition, the likelihood of threat occurrence had a main effect on participants' perceptions of self-risk ( $M_{lo\ risk} = 2.68$  vs.  $M_{hi\ risk} = 3.21$ ,  $F(1, 133) = 5.17$ ,  $p < .05$ ). Table 1 contains means and standard deviations for all conditions. No other contrasts or main effects were significant ( $ps > .10$ ). Finally, additional mediation analysis (following Baron & Kenny, 1986) indicates that the interactive effects of threat

and cultural similarity on behavioral intentions are fully mediated by perceived risk.<sup>1</sup>

### 3.3. Discussion

Results from Study 1 confirmed the hypothesis that under highly likely threats, participants' cultural identification with the origin of the threat resulted in elevated perceptions of risk as well as their intentions to engage in preventive behavior. These findings represent an important theoretical contribution by demonstrating that perception of risk and behavioral intentions can be affected by how culturally similar one feels to the origin of the threat.

It is important to note that in Study 1, the fictitious scenario described a potential threat occurring in either a culturally similar (England) or culturally dissimilar location (France). However, the personal relevance or importance of the topic to the individual was independent of the originating location and remained constant across conditions. Interestingly, prior research on health persuasion suggests that people activate a variety of defense mechanisms to protect themselves when their safety and health is threatened (Brown & Smith, 2007; Kiviniemi & Rothman, 2006; Leffingwell, Neumann, Babbitzke, & Boczar, 2007). For example, Freeman, Hennessy and Marzullo (2001) found that smokers exposed to anti-smoking videos responded with a significant amount of defensive processing, including information derogation. Likewise, Liberman and Chaiken (1992) found that threatening messages that are personally relevant lead people to engage in message denial in an attempt to reduce the threat. In their research, Liberman and Chaiken (1992) presented coffee drinkers (i.e., high personal relevance) and non-coffee drinkers (i.e., low personal relevance) with health messages linking caffeine and cystic fibrosis. High-relevance subjects agreed *less* with the highly threatening message than low-relevance subjects and agreed *more* with the reassuring message that refuted the link than did the low-relevance subjects. Consequently, we suggest that students reading a highly personally relevant message about food contamination might behave similarly and engage in defensive processing and denial mechanisms. In other words, under conditions of imminent threat but low personal relevance, we expect greater persuasion when subjects read a message about a health concern in a culturally similar location (vs. dissimilar location as indicated in H1 and supported by Study 1). However, when personal relevance is high, we expect subjects to engage in greater message denial, thus rendering the message about a health concern in a similar country *less* persuasive compared to a dissimilar location or low-relevance condition. Stated formally:

**H2.** Personal relevance will moderate the effects of cultural similarity such that:

- a) The effects described in Hypothesis 1 will *replicate* under conditions of lower personal relevance. However,
- b) The effects described in Hypothesis 1 will *reverse* under conditions of higher personal relevance such that under conditions of high likelihood of occurrence, perceived risk and intentions to reduce consumption of potentially contaminated food will be lower in the culturally similar condition than in the culturally dissimilar condition.

## 4. Study 2

### 4.1. Method and procedure

We used a 2 (cultural similarity: England vs. France) × 2 (likelihood of threat occurrence: low vs. high) × 2 (personal relevance: students vs.

<sup>1</sup> Analyses indicate significant direct effects of the interaction on perceived risk ( $\beta = .20$ ,  $p < .01$ ) and of perceived risk on behavioral intentions ( $\beta = .54$ ,  $p < .001$ ). The significant indirect effect of the interaction on behavioral intentions with perceived risk ( $\beta = .51$ ,  $p < .001$ ) is insignificant with the presence of the mediator ( $p = .43$ ). Similar analyses indicate full mediation for Studies 2 and 3 as well. Contact the first author for details.

general population) between-subjects design to assess the role of personal relevance in moderating the effect of cultural similarity on risk perception and behavioral intentions. Student participants were given the same stimulus as that used in Study 1, with one exception: half the subjects were told that the outbreak took place at three university cafeterias and that students in particular are affected by the contamination, and the other half were told that the outbreak took place at three grocery stores and that the threat applies to the general population.

One hundred and ninety-five Canadian citizen undergraduate students, of which 59% were male (41% female) with a mean age of 21.2, participated in this experiment for course credit. Participants were randomly assigned to one of eight experimental conditions. With the exception of the introduction of the additional personally relevant manipulation and corresponding manipulation check items, all other aspects remained the same as in Study 1. Upon completion of the experiment, all students were thanked and thoroughly debriefed.

4.1.1. Measures

Perception of risk was measured on a seven-point scale (1 = no risk at all, 7 = great deal of risk). The average of the three behavioral intent items (as in study 1) was used as the behavioral intentions measure (Cronbach's  $\alpha = .85$ ). Additionally, subjects rated the same items used in Study 1 to measure trust in government, cultural similarity and likelihood of threat occurrence. To check the personal relevance manipulation, subjects rated the extent (1 = not at all, 7 = very much) to which they feel similar to/identify with/sympathize with the population affected by the threat (Cronbach's  $\alpha = .73$ ). The average of the three items was used as the personal relevance measure.

4.2. Results

4.2.1. Manipulation checks

Manipulations were tested with 2 (cultural similarity: England vs. France)  $\times$  2 (likelihood of threat occurrence: low vs. high)  $\times$  2 (personal

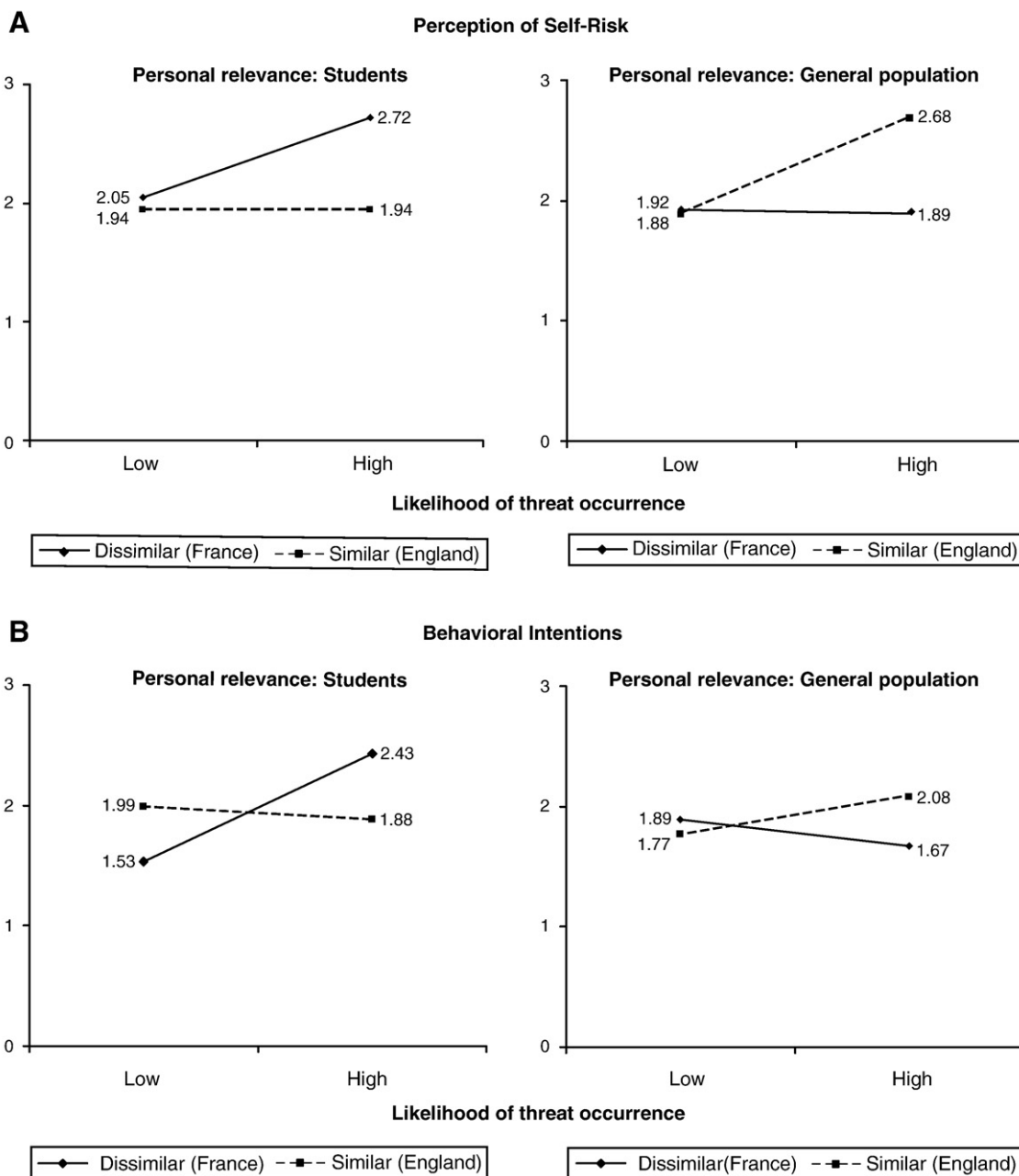


Fig. 1. Study 2 – personal relevance moderates the effect of cultural similarity on risk. A, perception of self-risk. B, behavioral intentions.

relevance: students vs. general population) between-subjects ANOVAs. Results showed (a) a main effect of likelihood of threat occurrence such that participants rated a greater likelihood of Canadians consuming contaminated food in the high event likelihood condition compared to the low event likelihood condition ( $M_{hi\ risk}=2.48$  vs.  $M_{lo\ risk}=1.92$ ;  $F(1, 186)=12.28$ ,  $p<.001$ ), (b) a main effect of personal relevance with participants reporting greater personal relevance when students were the target population of the threat than when it was the general population ( $M_{students}=4.29$  vs.  $M_{people}=3.89$ ;  $F(1, 186)=7.30$ ,  $p<.01$ ) and (c) a main effect of cultural similarity such that participants perceive themselves as more similar to people in England than to people in France ( $M_{England}=4.13$  vs.  $M_{France}=2.89$ ;  $F(1, 185)=82.88$ ,  $p<.001$ ). As desired, no other effects were significant ( $ps>.10$ ).

#### 4.2.2. Effects of personal relevance on perceptions of risk and behavioral intentions

Analysis of a 2 (cultural similarity: England vs. France) $\times$ 2 (likelihood of threat occurrence: low vs. high) $\times$ 2 (personal relevance: students vs. general population) between-subjects MANCOVA with trust in the foreign government as a covariate supports Hypotheses 2a and b. The predicted three-way interaction was observed for perceived risk ( $F(1, 186)=5.11$ ,  $p<.05$ ) and behavioral intentions ( $F(1, 186)=6.24$ ,  $p<.01$ ). Consistent with Study 1, trust in government was a significant covariate for perceived risk ( $F(1, 186)=4.42$ ,  $p<.05$ ,  $\beta=-.143$ ) and for behavioral intentions ( $F(1, 186)=4.24$ ,  $p<.05$ ,  $\beta=-.130$ ).

As can be seen in Fig. 1A and B, in the low personal relevance condition we obtained a significant effect of cultural similarity on how much participants in the high likelihood of threat occurrence condition felt themselves at risk ( $M_{England}=2.68$  vs.  $M_{France}=1.89$ ;  $F(1, 186)=5.51$ ,  $p<.05$ ), replicating the results of Study 1. A similar pattern was indicated on behavioral intentions, although significance was reached only on a one-tailed test ( $M_{England}=2.08$  vs.  $M_{France}=1.67$ ;  $F(1, 186)=1.74$ ,  $p<.10$ ). In addition, there was no significant effect of cultural similarity for participants in the low likelihood of threat occurrence. Within the high cultural similarity condition (England), perceptions of risk increased significantly from the low to high threat occurrence condition ( $M_{lo\ risk}=1.88$  vs.  $M_{hi\ risk}=2.68$ ,  $F(1, 186)=5.13$ ,  $p<.05$ ).

As predicted in Hypothesis 2b, this effect reverses when the threat is highly personally relevant. As shown in Fig. 1A and B, when the threat was highly personally relevant and highly likely to occur, respondents perceived lower risk ( $M_{England}=1.94$  vs.  $M_{France}=2.72$ ;  $F(1, 186)=5.31$ ,  $p<.05$ ) and indicated marginally lower behavioral intentions ( $M_{England}=1.88$  vs.  $M_{France}=2.43$ ;  $F(1, 186)=3.03$ ,  $p<.08$ ) in the culturally similar condition than the culturally dissimilar condition. Within the culturally dissimilar condition (France), perceptions of risk increased significantly from the low to high threat occurrence condition ( $M_{lo\ risk}=2.05$  vs.  $M_{hi\ risk}=2.72$ ,  $F(1, 186)=4.32$ ,  $p<.05$ ) and so did behavioral intentions ( $M_{lo\ risk}=1.53$  vs.  $M_{hi\ risk}=2.43$ ,  $F(1, 186)=9.07$ ,  $p<.01$ ).

Additional analyses were conducted for the cultural similarity by relevance interaction within the high likelihood of threat condition. Contrasts reveal that when the threat originated in a culturally dissimilar country (France), perceptions of risk increased significantly from the low to high personal relevance condition ( $M_{people}=1.89$  vs.  $M_{students}=2.72$ ,  $F(1, 186)=6.35$ ,  $p<.01$ ) and so did behavioral intentions ( $M_{people}=1.67$  vs.  $M_{students}=2.43$ ,  $F(1, 186)=6.27$ ,  $p<.01$ ). When the threat originated in a culturally similar country (England), perceptions of risk decreased significantly from the low to high personal relevance condition ( $M_{people}=2.68$  vs.  $M_{students}=1.94$ ,  $F(1, 186)=4.59$ ,  $p<.05$ ).

#### 4.3. Discussion

In this study, we demonstrated the effects of personal relevance on people's perceptions of risk and behavioral intentions. Our findings show that those in the culturally dissimilar condition perceived their risk to be the greatest and had the highest intentions to engage in preventive behaviors when they were told that the threat had affected

people (in this case, students) like themselves. Those in the culturally similar, high personal relevance condition, however, did not perceive their risk to be as great nor did they illustrate comparable levels to engage in future preventive actions.

Studies 1 and 2 demonstrate the theoretical importance of cultural similarity in judgments of health risk and behavior by presenting Canadian subjects with a threat originating in either the UK or France. It is possible, however, that since Canada is part of the British Commonwealth, the French might not just be culturally dissimilar but may also constitute a dissociative group for many English Canadians. Recent research suggests that dissociative reference groups can impact consumer preferences and that conditions that highlight the importance of self-identity/in-group identification can enhance the dissociative effects (White & Dahl, 2006, 2007). Thus, in Study 3, we seek to rule out this competing explanation and generalize our findings by using non-dissociative culturally similar and dissimilar countries. Since our two studies have thus far demonstrated effects only when the threat is highly likely to occur, we eliminated the low likelihood condition for our next study.

### 5. Study 3

#### 5.1. Method, procedure and measures

Ninety-eight Canadian citizen undergraduate students (55.1% female, 44.9% male, average age 20.1 years) participated in this study. A pretest determined two other European countries, Germany and Spain, as culturally similar and dissimilar, respectively ( $M_{Germany}=4.05$  vs.  $M_{Spain}=3.38$ ;  $F=7.23$ ,  $p<.01$ ). Respondents did not demonstrate any relative dissociative feelings on a two item scale "I would dislike personal associations of any kind with the country..." and "I would dislike personal associations of any kind with people from..." ( $M_{Germany}=2.03$  and  $M_{Spain}=2.11$ ,  $F=.22$ ,  $p=.64$ ). Thus, subjects were randomly assigned to one of four experimental conditions: 2 (cultural similarity: Germany vs. Spain) $\times$ 2 (personal relevance: students vs. general population).

Similar to Studies 1 and 2, participants were given an article regarding a fictitious dioxin food poisoning crisis in Germany (Spain). The high (low) personal relevance article mentioned that the outbreak took place at three university cafeterias (grocery stores) and university students (people) suffered serious health effects because they ate food contaminated with dioxin. After reading the article, respondents were asked to write down the thoughts that crossed their minds and how they were feeling as they read the article. After answering the thought listing question, respondents were queried on 7-point items that included measures of a) risk perception, b) behavioral intentions, c) message denial, d) trust in the government, e) cultural similarity, f) personal relevance, and g) feelings of dissociation. Measures for behavioral intentions, trust in the government, cultural similarity, and personal relevance were similar to those used in Study 2. Dissociation was measured on the same items used in the pretest and described earlier. Perceived risk was measured on a four-item 7-pt scale: indicate what you think your risk level is for consuming dioxin-contaminated beef or milk products, how risky the dioxin poisoning situation is for you personally, how frightening the threat of dioxin contamination is for you personally, and how serious you think is the threat of dioxin contamination (Cronbach's  $\alpha=.79$ ). Message denial was assessed using a four-item 7-point Likert scale: "The article didn't say anything that makes me think consuming beef and milk products is unsafe in Canada," "Beef and milk are safe to consume in Canada," "There is not enough evidence that beef and milk products in Canada may be contaminated," and "The article does not provide enough evidence for me to be concerned about getting affected by this food poisoning situation" (Cronbach's  $\alpha=.71$ ). Additionally, open-ended thought listings were categorized by two independent coders ( $r=.98$ , disagreements were resolved by the authors) who were blind to the

**Table 2**  
Study 3: estimated means and standard errors

Effect	Perceived risk		Behavioral intentions		Message denial		Denial thoughts		Personal relevance		Cultural similarity	
	M	(SE)	M	(SE)	M	(SE)	M	(SE)	M	(SE)	M	(SE)
Low personal relevance (people)												
Culturally dissimilar (Spain)	2.54 <sub>a</sub>	.225	1.86 <sub>a</sub>	.238	4.90 <sub>a</sub>	.223	1.81 <sub>a</sub>	2.42	2.79 <sub>a</sub>	.303	3.85 <sub>a</sub>	.285
Culturally similar (Germany)	3.29 <sub>b</sub>	.216	2.57 <sub>b</sub>	.229	4.55 <sub>a</sub>	.214	3.97 <sub>a</sub>	2.33	2.17 <sub>a</sub>	.291	3.17 <sub>a</sub>	.268
High personal relevance (students)												
Culturally dissimilar (Spain)	3.19 <sub>b</sub>	.224	2.84 <sub>b*</sub>	.238	4.18 <sub>b</sub>	.218	3.07 <sub>a</sub>	2.37	3.10 <sub>a</sub>	.297	3.56 <sub>a</sub>	.273
Culturally similar (Germany)	2.67 <sub>b</sub>	.233	1.89 <sub>c</sub>	.247	5.09 <sub>c</sub>	.228	15.62 <sub>b</sub>	2.48	3.02 <sub>a</sub>	.310	3.91 <sub>a</sub>	.285

Note. Cell means within columns with different subscripts differ at  $p < .05$ . \*differ at  $p < .01$ .

experimental conditions. Examples of thoughts coded as message denial include: “Clearly this article is trying to be sensational and hit university students hard,” “Skepticism as to the truth of the article,” and “The story doesn't sound believable.” Message denial was calculated as the percent of denial thoughts to total thoughts to control for individual response style differences.

After completing the questionnaire, subjects were thoroughly debriefed.

## 5.2. Results

### 5.2.1. Manipulation check

To test for the personal relevance manipulation, we conducted a 2 (cultural similarity: Germany vs. Spain) × 2 (personal relevance: students vs. general population) ANOVA. The results confirm a main effect of personal relevance with participants reporting greater personal relevance when students were the target population of the threat than when it was the general population ( $M_{students} = 3.06$  vs.  $M_{people} = 2.48$ ;  $F(1, 94) = 3.71, p = .05$ ). Results confirm a main effect of cultural similarity such that participants perceive themselves as more similar to people in Germany than to people in Spain ( $M_{Germany} = 3.91$  vs.  $M_{Spain} = 3.34$ ;  $F(1, 93) = 15.98, p < .001$ ); there was no difference in dissociative feelings toward Germany vs. Spain ( $M_{Germany} = 1.93$  and  $M_{Spain} = 1.88$ ;  $F(1, 94) = .29, p = .59$ ). No other effects were found to be statistically significant ( $p > .10$ ). Table 2 contains means and standard deviations.

### 5.2.2. Perceptions of risk and behavioral intentions

Results of a 2 (cultural similarity: Germany vs. Spain) × 2 (personal relevance: students vs. general population) between-subjects MANOVA support Hypothesis 2. Consistent with the results found in Study 2, a two-way interaction was observed for perceived risk ( $F(1, 93) = 8.12, p < .01$ ) and behavioral intentions ( $F(1, 93) = 12.43, p < .001$ ). Trust in government was a significant covariate for perceived risk ( $F(1, 93) = 4.82, p < .05, \beta = -.205$ ) and behavioral intentions ( $F(1, 93) = 13.85, p < .001, \beta = -.367$ ).

Importantly, the results replicate our findings from Study 2 that behavioral intentions are significantly lower ( $M_{Germany} = 1.89$  vs.  $M_{Spain} = 2.84, F(1, 93) = 7.38, p < .01$ ) and risk perception is marginally lower ( $M_{Germany} = 2.67$  vs.  $M_{Spain} = 3.19, F(1, 93) = 2.44, p < .06$ , one-tailed) for participants in the high relevance condition when the origin is culturally similar (Germany) than when it is dissimilar (Spain). By contrast, behavioral intentions ( $M_{Germany} = 2.57$  vs.  $M_{Spain} = 1.86, F(1, 93) = 4.54, p < .05$ ) and risk perception ( $M_{Germany} = 3.29$  vs.  $M_{Spain} = 2.54, F(1, 93) = 5.72, p < .05$ ) are higher for the culturally similar origin (Germany) than for the dissimilar origin (Spain) for participants in the low personal relevance condition.

In addition, within the culturally dissimilar condition (Spain), subjects in the high (vs. low) personal relevance condition demonstrated higher risk perceptions ( $M_{students} = 3.19$  vs.  $M_{people} = 2.54; F(1, 93) = 4.31, p < .05$ ) and behavioral intentions ( $M_{students} = 2.84$  vs.  $M_{people} = 1.86; F(1, 93) = 8.75, p < .01$ ). Similarly, within the culturally similar condition (Germany), subjects in the high (vs. low) personal relevance condition

demonstrated significantly lower risk perceptions ( $M_{students} = 2.67$  vs.  $M_{people} = 3.29; F(1, 93) = 3.87, p < .05$ ) and behavioral intentions ( $M_{students} = 1.89$  vs.  $M_{people} = 2.57; F(1, 93) = 4.17, p < .05$ ). Means and standard errors are reported in Table 2.

### 5.2.3. The role of message denial

Results from two distinct measures confirm the message denial explanation for the reversal of effects. ANOVA tests revealed a significant two-way interaction of personal relevance × cultural similarity on both the message denial scale ( $F(1, 94) = 8.07, p < .01$ ) and the thought listings index ( $F(1, 94) = 4.68, p < .05$ ). As expected, in the high relevance condition, subjects demonstrated higher message denial when the potential contamination occurs in a culturally similar location than a culturally dissimilar location (message denial scale:  $M_{Germany} = 5.09$  vs.  $M_{Spain} = 4.18; F(1, 94) = 8.26, p < .01$ ; percent of denial thoughts:  $M_{Germany} = 15.62$  vs.  $M_{Spain} = 3.07; F(1, 94) = 13.40, p < .001$ ). Estimated means and standard error values for message denial are shown in Table 2.

To further evaluate the role of message denial in the reversal of the effects, we tested if the interaction of personal relevance and cultural similarity on risk perception is mediated by message denial. As specified by Baron and Kenny (1986), three conditions need to be satisfied for the existence of mediation. First, the direct effect of the two-way interaction between personal relevance and cultural similarity on risk perception must be significant. Second, the two-way interaction between personal relevance and cultural similarity must have a significant effect on message denial. Third, the direct effect of the two-way interaction between personal relevance and cultural similarity on risk perception in the presence of the mediator (i.e., message denial) must be significantly reduced in comparison to the direct effect model. The results of three regression analyses confirm the mediation effect. The first two models with risk perception and message denial as respective dependent measures revealed significant effects of the two-way interaction between personal relevance and cultural similarity on both risk perception ( $\beta = -.63, p < .01; R^2 = .14$ ) and message denial ( $\beta = .58, p < .01; R^2 = .14$ ). The third model, the mediation model, revealed a significant effect of message denial ( $\beta = -.42, p < .001$ ), as well as a substantial reduction in the effect of the two-way interaction between personal relevance and cultural similarity on risk perception. The remaining effect of the two-way interaction was found to be only marginally significant in the presence of the mediator ( $\beta = -.39, p < .07, R^2 = .28$ ), and the effect size was reduced by 38% ( $\beta = -.63$  vs.  $\beta = -.39$ ). Thus, message denial partially mediated the two-way interaction between personal relevance and cultural similarity on risk perception.<sup>2</sup>

## 5.3. Discussion

Study 3 replicated the findings from our first two studies with a context that eliminated any potential dissociative biases arising from Canadian students' perceptions of France. Using Germany as our

<sup>2</sup> Similar analyses indicate partial mediation for thought listing data as well. Contact the first author for details.

culturally similar condition and Spain as our culturally dissimilar condition, we were able to show that under high personal relevance, participants in the culturally similar condition had lower behavioral intentions than those in the culturally dissimilar condition. Although the results are directionally consistent with Study 2, risk perception was only marginally lower for these participants. Comparing the absolute levels of risk perception across studies, we noticed that perceived risk overall is lower in Study 3 than in Study 2. We speculate this is due to participants' lesser familiarity with Germany and Spain than with the UK and France and may account for the marginal result on this measure. As expected, however, under low personal relevance, participants in the culturally similar condition rated their risk and behavioral intentions higher than those in the culturally dissimilar condition.

## 6. General discussion

We examined the effects of cultural similarity on people's perceptions of risk of a food-borne contamination. We demonstrated that when the threat is highly likely to occur, people perceive their risk to be higher if the threat originates from a culturally similar country. In addition, intention to engage in preventive behaviors against that risk increases. However, when personal relevance is high, defensive processing reduces risk perception. Specifically, the combined effect of cultural similarity and high personal relevance results in lower risk perceptions and intentions to engage in preventive health behavior.

Our findings contribute to prior research on risk perception by examining an important antecedent of risk perceptions: cultural similarity. To our knowledge, this is the first paper to do so. Importantly, while the focus of our research was the role of perceived cultural similarity in increasing people's perceptions of risk, we were also able to illustrate how those effects can be reversed through the salience of personal relevance. Thus, our study contributes to and extends the biased-processing literature that suggests that whenever a message is perceived to be threatening to some aspect of the self-concept, it will result in biased and defensive processing of the message (Freeman et al., 2001). In our research, personal relevance was able to surpass perceptions of cultural similarity and thus led participants to demonstrate completely opposite effects in regards to their perceived risk and behavioral intentions.

Our findings provide support for self-categorization theory (Abrams, 1994; Turner et al., 1987) within the health risk behavior domain. Accordingly, self-categorization theory conceptualizes identity in terms of a hierarchy and describes people's behavior based on the particular aspects of that identity that are made salient. Furthermore, self-categorization theory argues that when a larger social identity is made salient, one will act in accordance with group standards and beliefs that are reflective of group membership. Thus, attention brought to this public aspect of the self will correspond with actions and attitudes consistent with the overall group. However, when a more specific, deeper level of identity is made salient (such as a more relevant aspect of personal identity), people behave differently. In this instance, individuals are likely to resist group influence, including attitudes and beliefs. Therefore, one can argue that our findings regarding a reversal toward lower risk perceptions and behavioral intentions when a deeper, more specific aspect of identity was made salient reflect the fact that people felt the risk was more relevant to their own, more personal self, and hence demonstrate responses consistent with denial of that risk. On the other hand, the salience of cultural similarity allowed people to perceive their risk and focus their behavioral intentions as part of the larger group, thus exhibiting attitudes about the threat consistent with the greater perception of the culturally similar group.

In both Studies 2 and 3, personal relevance was manipulated as student (high relevance) vs. general population (low relevance). Use of a specific population, like students, might render the potential contam-

ination scenario more vivid compared to a general population. It is not clear, however, what effect increased vividness would have on risk perception and behavioral intentions. Prior research has demonstrated that the persuasiveness of vivid over non-vivid information depends on resource allocation (Keller & Block, 1997). Other research suggests that vivid health-related information is more persuasive under conditions of high self-efficacy, but less persuasive under conditions of low self-efficacy (Block & Keller, 1997). Future research might extend the current study to specifically explore the effect of vividness in a food-borne contamination scenario.

Our results are consistent with other research on food contamination crises. Pennings et al. (2002) interviewed German, American and Dutch consumers on their reaction to mad cow disease. Interestingly, Pennings et al. found that despite Germany and Netherland's physical proximity and their similar experience with the disease, Dutch perceptions resembled American rather than German perceptions. The authors speculate that American and Dutch consumers are more trusting of their government than Germans. In our studies, we measured trust in government and found that, indeed, it is negatively correlated with increased risk. In addition, Kuttischreuter (2006) found that people's avoidance of risk in a food crisis was characteristic of their risk perception, coping perception, and affective response. In a survey study involving 280 Dutch consumers, Kuttischreuter asked the respondents to imagine two different food contamination situations (salmonella and dioxin contamination of chicken) and then respond to a set of questions related to risk perception and risk avoidance behavior. Her findings suggest that consumers who would engage in avoidance behavior were the ones who perceived themselves to be at a higher risk, felt more worried, and demonstrated a lower level of trust in the safety of food products. In the present study, we also demonstrate that perceived risk is a determinant of intentions to avoid affected food. Further, we document the mediating role that perceived risk plays in this process. We extend research by Pennings et al. (2002) and Kuttischreuter (2006) by exploring the role played by cultural similarity in perception of risk in such situations.

As past researchers have documented, with the world's regional integration has arisen a new type of consumer dynamic (Douglas & Craig, 1997). For example, Verlegh, Steenkamp and Meulenberg (2005) show that consumers use country-of-origin information to evaluate the quality and purchase intent of food products (Dutch vs. German tomatoes). It is important to view the changing consumer in terms of not only goods and services, but also in terms of the crucial implications for consumer behavior within the health marketing domain (Leeflang & van Raaij, 1995). Taken together, the current study and the Kuttischreuter (2006) and Pennings et al. (2002) studies point to the need for public health officials and managers of food products to respond carefully to potential future food scares.

Our studies suggest that if a food contamination occurs in an outside country that supplies food to your own, compliance with consumption recommendations would be enhanced by highlighting the psychological similarities of the two countries. This might be achieved through media recommendations and public relations opportunities. Alternately, if the threat occurs in a psychologically close country, but not one from whom you import the food items, managers would do well to heighten the perceived dissimilarities in order to restrain a public panic or undue food restrictions. Importantly, our studies show defensive processing occurring when the threat becomes too personal. In these instances, managers and public health officials would do well to integrate methods to reduce defensive processing into their consumption recommendations. One example is that suggested by Block and Williams (2002): to design message content that actively encourages elaboration. Another practical example would be to design message content to specifically counter defensive resistance by acknowledging consumers' denial and drawing attention to their biases.

In this age of global trade and communication, it is important to examine the effects of a crisis that might cross national boundaries. As

a recent article in the Star Tribune (McKinney, 2007, p. A1) stated, "Today's family meal is a global affair, with a menu of main courses, side dishes and unseen ingredients arriving from the farthest corners of the Earth." A food crisis that erupts in Vietnam or in Brazil might be as important and alarming for people living in the US or Canada as it is for people living in those countries where the crisis is taking place. Our research provides insights on how consumers will respond to food crises in the context of imports. Further, it presents some important factors that public policy makers should consider while designing health-related warnings to dangers from overseas.

## References

- Abrams, D. (1994). Social self-regulation. *Personality and Social Psychology Bulletin*, 20(5), 473–483.
- Agrawal, N., Menon, G., & Aaker, J. (2007). Getting emotional about health. *Journal of Marketing Research*, 44(1), 100–113.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173–1182.
- Block, L. G., & Keller, P. A. (1997). Effects of self-efficacy and vividness on the persuasiveness of health communications. *Journal of Consumer Psychology*, 6(1), 31–54.
- Block, L. G., & Williams, P. (2002). Undoing the effects of seizing and freezing: Decreasing defensive processing of personally relevant messages. *Journal of Applied Social Psychology*, 32(4), 803–833.
- Brewer, N. T., Chapman, G. B., Gibbons, F. X., Gerrard, M., McCaul, K. D., & Weinstein, N. D. (2007). Meta-analysis of the relationship between risk perception and health behavior: The example of vaccination. *Health Psychology*, 26(2), 136–145.
- Brown, J. D., Novick, N. J., Lord, K. A., & Richards, J. M. (1992, May). When Gulliver travels: Social context, psychological closeness, and self-appraisals. *Journal of Personality and Social Psychology*, 62, 717–727.
- Brown, S. L., & Smith, E. Z. (2007). The inhibitory effect of a distressing anti-smoking message on risk perceptions in smokers. *Psychology & Health*, 22(3), 255–268.
- de Jonge, J., Frewer, L., van Trijp, H., Renes, R. J., de Wit, W., & Timmers, J. (2004). Monitoring consumer confidence in food safety: An exploratory study. *British Food Journal*, 106(10/11), 837–849.
- Douglas, S. P., & Craig, C. S. (1997). The changing dynamic of consumer behavior: Implications for cross-cultural research. *International Journal of Research in Marketing*, 14, 379–395.
- Dow, D. (2000). A note on psychological distance and export market selection. *Journal of International Marketing*, 8(1), 51–64.
- Fischhoff, B., Gonzalez, R. M., Small, D. A., & Lerner, J. S. (2003). Judged terror risk and proximity to the World Trade Center. *Journal of Risk and Uncertainty*, 26, 137–151.
- Freeman, M. A., Hennessy, E. V., & Marzullo, D. M. (2001). Defensive evaluation of antismoking messages among college-age smokers: The role of possible selves. *Health Psychology*, 20, 424–433.
- Heslop, L., Papadopoulos, N., & Bourke, M. (1998). An interregional and intercultural perspective on subculture differences in product evaluation. *Canadian Journal of Administrative Sciences*, 15(2), 113–127.
- Hofstede, G. (1980). *Culture's consequences: International differences in work-related values*. CA: Sage.
- Houghton, J. R., van Kleef, E., Rowe, G., & Frewer, L. J. (2006). Consumer perceptions of food risk management practices: A cross-cultural study. *Health, Risk and Society*, 8(2), 165–183.
- Keller, P. A., & Block, L. G. (1997, December). Vividness effects: A resource-matching perspective. *Journal of Consumer Research*, 24, 295–304.
- Kiviniemi, M. T., & Rothman, A. J. (2006). Selective memory biases in individuals' memory for health-related information and behavior recommendations. *Psychology and Health*, 21, 247–272.
- Kuttschreuter, M. (2006). Psychological determinants of reactions to food risk messages. *Risk Analysis*, 26(4), 1045–1057.
- Leefflang, P. S. H., & van Raaij, W. F. (1995). The changing consumer in the European Union: A "meta-analysis". *International Journal of Research in Marketing*, 12, 373–387.
- Leffingwell, T. R., Neumann, C. A., Babitzke, A. R., & Boczar, M. J. (2007). Defensively biased responding to risk information among alcohol-using college students. *Addictive Behaviors*, 32(1), 158–165.
- Liberman, A., & Chaiken, S. (1992). Defensive processing of personally relevant health messages. *Personality and Social Psychology Bulletin*, 18(6), 669–679.
- Luce, M. F., & Kahn, B. E. (1999, December). Avoidance or vigilance? The psychology of false positive test results. *Journal of Consumer Research*, 26, 242–259.
- McKinney, M. (2007, July 15). Food from China: Can you trust it? *Star Tribune*, A1.
- Menon, G., Block, L. G., & Ramanathan, S. (2002, March). We're at as much risk as we are led to believe: Effects of message cues on judgments of health risk. *Journal of Consumer Research*, 28, 533–549.
- Pennings, M. E., Wansink, B., & Meulenberg, M. T. G. (2002). A note on modeling consumer reactions to a crisis: The case of the mad-cow disease. *International Journal of Research in Marketing*, 19(1), 91–100.
- Raghubir, P., & Menon, G. (1998, June). AIDS and me, never the twain shall meet: The effects of information accessibility on judgments of risk and advertising effectiveness. *Journal of Consumer Research*, 25, 52–63.
- Reyna, V. F., & Adam, M. B. (2003). Fuzzy-trace theory, risk communication and product labeling in sexually transmitted diseases. *Risk Analysis*, 23, 325–342.
- Reyna, V. F., & Brainerd, C. J. (1995). Fuzzy-trace theory: An interim synthesis. *Learning & Individual Differences*, 7, 1–75.
- Reyna, V. F., & Farley, F. (2006). Risk and rationality in adolescent decision making: Implications for theory, practice, and public policy. *Psychological Science in the Public Interest*, 7, 1–44.
- Sen, S. (2004). The behavioral consequences of HIV testing: An experimental investigation. *Journal of Public Policy and Marketing*, 23(1), 28–42.
- Teigen, K. H. (2005). The proximity heuristic in judgments of accident probabilities. *British Journal of Psychology*, 96, 423–440.
- Trope, Y., Liberman, N., & Wakslak, C. (2007). Construal levels and psychological distance: Effects on representation, prediction, evaluation, and behaviour. *Journal of Consumer Psychology*, 17(2), 83–95.
- Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the social group: A self-categorization theory*. Oxford: Blackwell.
- Verlegh, P., Steenkamp, J., & Meulenberg, M. (2005). Country-of-origin effects in consumer processing of advertising claims. *International Journal of Research in Marketing*, 22, 127–139.
- Wang, C., & Lamb, C., Jr (1983). The impact of selected environmental forces upon consumers' willingness to buy foreign products. *Journal of the Academy of Marketing Science*, 11(2), 71–84.
- Weinstein, N. (1993). Testing four competing theories of health-protective behavior. *Health Psychology*, 12, 324–333.
- White, K., & Dahl, D. W. (2006). To be or not to be? The influence of dissociative reference groups on consumer preferences. *Journal of Consumer Psychology*, 16(4), 404–414.
- White, K., & Dahl, D. W. (2007). Are all out-groups created equal? Consumer identity and dissociative influence. *Journal of Consumer Research*, 34(4), 525–536.