Dioxin in Food:
The Influence of Parenthood on Risk Avoidance Behavior

Bachelorthesis

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Abstract

Hazardous substances are increasingly found in our food. The consumption of all these different hazardous substances can have severe health implications. Especially dioxin can be a serious threat to our health. It is often is a challenge to motivate people to engage in prevention to avoid potential health risks. Therefore, it is of crucial importance to identify the aspects that influence risk avoidance behavior in order to develop efficient risk messages and thereby help people to protect their own health. In this study, a model has been proposed including relevant variables related to risk avoidance and information seeking behavior. Furthermore, differences between women with children and women without children have been analyzed. It has been hypothesized that this model is able to explain risk avoidance and information seeking behavior. Furthermore, it has been hypothesized that women with small children report higher levels of both risk avoidance and information seeking behavior. 115 women between the age 30 and 60 participated in the cross-sectional survey. The survey consisted of different constructs that had been identified as important determinants of risk avoidance behavior and information seeking behavior. The different items have been measured by 5-point Likert-scales. The model was tested using correlation analysis and backwards regression analysis. The differences between the three groups were examined using one-way between subject analysis of variance (ANOVA) and subsequent post hoc tests using the Bonferroni method. The results showed that actual knowledge, self-efficacy, relevance and attitude towards changing eating behavior were significantly predicting risk avoidance behavior. Perceived knowledge, safety, expectation, relevance and information sufficiency were significantly predicting information seeking behavior. Women without children reported significantly lower levels of both risk avoidance and information seeking behavior compared to both other groups. Women with small children reported higher information seeking behavior but no higher levels of risk avoidance behavior compared to women with older children. The study successfully tested a model to explain risk avoidance and information seeking behavior and it supported the assumption that women with children execute higher levels of risk avoidance behavior than those without children.

Introduction

Each day, tons of food are purchased, cooked and eaten without considering possible risks. While food is crucial for survival, it can also be a threat to life. In the last decade, more and more food with hazardous ingredients has been found in Germany. In 2000, the BSE epidemic took place. In 2001, chloramphenicol, a forbidden bacteriostatic antimicrobial has been found in shrimps. In 2002, oil and lead remittances have been found in breadstuffs. In 2003, highly carcinogenic substances have been found in glass-canned food. In 2004, expired meat have been labeled with a new date of expire. In 2005, cheese and milk that were contaminated with dangerous bacteria have been found. In 2006, glycerin in wine has been found. In 2007, several big poultry enterprises in Germany have been contaminated with Salmonella. In 2008, rotten meat from Italy has been sold in German supermarkets. In 2009, toxic ingredients have been found in rocket salad. In 2010, listeria, a pathogenic bacterium, has been found in several types of cheese in the supermarket chain LIDL. The most recent incident of hazardous substances in food was the found of dioxin in eggs and pork meat in January 2011 (e.g. Dowling, 2011; Preuk, 2011; Verbraucherzentrale, 2011).

All these different incidents in the last 10 years are just examples. Each year several more substances that are hazardous are found in food exposing consumers in Germany to high danger. The consumption of all these different hazardous substances can have serious health implications. Some of them injure the nervous system, others cause brain damage, and still others enhance the risk for cancer. However, most people do not avoid particular food despite the severe consequences.

Most of these incidents can be ascribed to different forms of food contamination. The European Union distinguishes five different kinds of food contamination (European Union, n.d.). The first one is the contamination with microbiological substances. This includes for example bacteria, viruses, germs of disease and hormones. The next category is the physical contamination, which includes the contamination of food with oil, lead, glass fragments, and other kinds of physical substances. Another possible contamination is the contamination of food through gen-manipulated organism. The fourth possible source of contamination is nuclear radiation. The last and for this article most interesting source of contamination is the contamination of food through chemical substances. This category includes food contamination with pesticides, fertilizer, biocides, mercury, dioxin and other chemical substances. Especially dioxin can be a serious threat to our health.

Dioxin

Dioxins are persistent organic pollutants. They emerge as byproducts of different kinds of industrial processes but can also result from natural processes such as volcanic eruptions and forest fires. They are highly toxic and endure a long time because of their ability to be absorbed by fat tissue. The effects of dioxin on humans can be divided into short and long-term consequences. According to the WHO (2010), short-term exposure may result in skin lesions and altered liver function, while long-term exposure is linked to impairment of the immune system, the nervous system, the endocrine system, the enzyme system and reproductive functions. According to the Federal Environment Agency (2011), after the dioxin catastrophe in Seveso, Italy, there has been a shift in the sex ratio at birth. It has been found that men, who were considerably young at the time of the dioxin catastrophe fathered more girls later in life. This supports the assumption that dioxin can damage reproductive functions, especially of people who are not fully developed at the time they get in contact with dioxin. Furthermore, animal testing has shown that exposure to dioxin results in several types of cancer. Some kinds of dioxins are assumed to be carcinogenic for humans as well (Bundesinstitut für Risikobewertungen, 2011). Most sensitive to exposure are the developing fetus and the newborn, due to the rapidly developing organ system. Furthermore, dioxin can have severe consequences for girls and young women because of a possible pregnancy and breast-feeding practices in their future.

Dioxin is omnipresent; therefore, it is not possible to avoid it completely. However, it is important due to the high toxic potential that additional exposure to dioxin e.g. through contaminated eggs is avoided. The so-called body burden determines how much dioxin can be absorbed by a person without causing severe consequences. In particular, the body burden is the amount of dioxin per kilogram body fat that a person has absorbed in his/her body during his/her life and which will be present over the long-term. The WHO states that a daily intake of 1-4pg/kilogram body weight is tolerable. However, the WHO also emphasized that a lower intake should be set as a goal (World Health Organization, 2010). The main problem with dioxin is that it is absorbed in the fat tissue of humans and that it is important to be sure that the body burden is not at a critical stage even when a person gets older (Bundesinstitut für Risikobewertungen, 2011).

A study carried out in Ireland after a dioxin scandal in 2008, showed that lay people generally have difficulties in estimating the risk of dioxin (Kennedy et al., 2010). The respondents were asked to indicate the danger of different kind of foods with regard to human health. It was found that PCBs/dioxins were considered to pose less of a risk than high fat

food, stress, or cigarettes, for example, but they were considered to pose a higher risk than alcohol, nuclear power and AIDS, for example. 27.5 % of the respondents answered that they do not know the risk of PCBs/dioxins. This clearly shows that, at least in Ireland, the public awareness of the risks of dioxins is ambiguous. Some respondents estimated the risk as quite high, whereas more than one quarter of the respondents did not know how harmful dioxin can be. This shows that the risk perception of dioxin considerably varies within the broad public.

Motivation for the Study

The study on dioxin in Ireland showed that there is still need to inform the public about the possible consequences of dioxin intake. On the one hand, this should be done to motivate people to engage in risk avoidance behavior, but on the other hand, it would also decrease the panic that often accompanies incidents of food contamination. As Weinstein (1993) pointed out, it is often a challenge to motivate people to engage in behavior to prevent or avoid potential risks to their health. Therefore, it is of crucial importance to identify the aspects that influence risk avoidance behavior in order to develop efficient risk messages to help people protecting their health.

Furthermore, in the case of dioxin, young children are especially at risk, because their body burden is very low and absorbing dioxin at an early stage in life increases the risk to fall ill because of dioxin at a later stage in life. Therefore, this study also assess whether parents are aware of the risk their children face, whether they seek additional information in order to be able to estimate the risk better and whether they execute more risk avoidance behavior. There is research available comparing the risk perception of parents concerning different kind of risks. However, there is, as far as I am aware of, no research done that compares risk avoidance behavior of parents in relation to dioxin. In order to fill this gap, this study identifies relevant variables that influence risk avoidance behavior and information seeking behavior. Furthermore, this study compares women without children and women with children in different age groups with regard to their information seeking and risk avoidance behavior.

Conceptual Framework

Risk Avoidance Behavior

Numerous theories exist about risk perception and risk avoidance behavior. One of the most famous models is the Protection Motivation Theory (Rogers, 1975; Maddux & Rogers, 1983). The PMT has been applied to a number of different threats, especially health-related threats.

In the case of health-related threats, the model is used to understand and predict protective health behavior (Milne, Sheeran & Orbell, 2000). The model implies that there are two ways to perceive a risk. On the one hand, there is the threat appraisal. The threat appraisal includes variables relevant to an individual's perception of threats such as perceived vulnerability (susceptibility), perceived severity and fear. On the other hand, there is the coping appraisal. The coping appraisal is concerned with variables relevant to the coping abilities of an individual person. The variables included are self-efficacy, response-efficacy (expectation) and response costs. The different variables combined leads to an intention to behave.

The usefulness and the predictive potential of these variables have been shown amongst others in the meta study carried out by Milne et al. in 2000. This meta study showed that all the different variables are significantly related to the intention to behave. It was also found that especially self-efficacy has a strong and robust correlation with actual behavior, thus the risk avoidance behavior. Kuttschreuter (2006) found in her research about the psychological determinants of reactions to food risk messages a strong correlation between self-efficacy and outcome expectancy. Due to the strength of this correlation, she advises to combine both aspects in one variable, indicating the level of confidence in coping with a threat. In the study at hand, this relationship will be tested again. Therefore, both variables are included in the model individually. However, it is expected that the correlation between the two variables is very strong.

The Protection Motivation Theory forms the basis of the model tested in this study. Most variables of the PMT are included in the proposed model. The dependent variable is risk avoidance behavior as in the PMT. The intention to behave, or the attitude to change one's behavior respectively, has been given a central position in the model (see figure 1). The variable intention to behave moderates all the other variables and depending on the strength of the different variables the decision either to avoid a particular food or to proceed with eating that particular food will be taken. This mediating role of the variable attitude towards a risk is indicated in relevant literature concerned with the PMT (e.g. Milne et al., Hodgkins & Orbell, 1998).

Determinants of Risk Avoidance Behavior

As mentioned above, other relevant variables with relation to risk avoidance behavior were identified and included in the model as well. One of these variables is authorities' management. The relation between authorities' management and risk perception has been proposed in an article written by Kennedy et al. (2010). This article dealt with the dioxin

scandal in Ireland in December 2008; thus, it can be assumed that the variable authorities' management plays a role in the case at hand as well. Their research indicates that trust in authorities and authorities' management has a clear impact on risk perception. Respondents who rated the management of authorities as 'very efficient' reported lower levels of risk than respondents who did not know how to rate the management of authorities or who rated it as inefficient. In a study carried out by Lobb et al. (2006), the variable trust has been found to correlate with both risk perception and attitude towards changing behavior. However, I hypothesize that authorities' management does not only influence risk perception but has an impact on the attitude towards changing eating behavior as well. Furthermore, it is assumed that there are other aspects related to authorities' management that influence the attitude towards changing eating behavior and the risk perception as well. Next to trust and management, I propose the variables "safety" (the products in German supermarkets are safe to eat), "expertise" (the authorities have enough knowledge to deal with the scandal) and "future" (the German food producers should be regulated more strictly).

The next variable included in the model, is anticipated regret. Regret as defined by Conner et al. (2006) is "a negative, cognitive based emotion that is experienced when we realize or imagine that the present situation could have been better had we acted differently". Anticipated regret is therefore the regret we can expect to feel in the future. Conner et al. (2006) conducted research on how far anticipated regret influences the intention to quit smoking. They found significant positive correlations between anticipated regret and the intention to stop smoking. There is no data available with regard to food-related risks and anticipated risk, but a positive correlation is also assumed for these variables. Therefore, it is hypothesized that anticipated regret positively correlates with the attitude towards the risk.

Another variable of my model is relevance. Relevance is assumed to be an important determinant of protective reactions to health information (Ruiter, Abraham & Kok, 2001). Therefore, high relevance should be positively correlated with the attitude towards changing one's behavior as well as with risk avoidance behavior (Ruiter et al., 2001).

Information Seeking Behavior

As pointed out by Lion et al. (2002), in risk avoidance literature respondents are often viewed as passive risk perceivers. However, in reality, people most often actively seek information in order to estimate risks. Thereby, it is important to distinguish between systematic information processing and heuristic information processing. Unless motivated to engage in systematic information processing, people tend to use the fast and simple heuristic information

processing. However, when considering risk messages it is often necessary for people to engage in systematic information seeking in order to correctly estimate the actual risk and the possible consequences for one's own health.

According to Eagly and Chaiken (1993), information sufficiency is a key factor for information seeking behavior. Thereby, a person's desire for sufficiency leads to more systematic information seeking. Besides, personal relevance increases the desire for sufficiency. Griffin et al. (1999) propose that individuals mainly engage in active information seeking when the faced risk is personal relevant and when they feel that they need more information. Thus, not actual knowledge determines whether people engage in information seeking but the perceived knowledge. Knowledge can thus be differentiated in actual knowledge and perceived knowledge. However, it is hypothesized that perceived knowledge has a higher impact on information seeking behavior than actual knowledge.

Differences in Risk Perception

A variable risk perception is often associated with risk avoidance behavior. Several researches pointed out the importance of risk perception in decisions concerning risk avoidance behavior (e.g. Yeung & Morris, 2001). Risk perception is a widely studied phenomenon within psychology. Numerous articles deal with risk perception, and the variables influencing risk perception. Thereby, especially gender differences are an intensively studied subject. Several articles point out that gender is an important determinant of risk perception (Frewer, 2000; Gutteling & Wiegman, 1993). The general finding is that women regard a range of health risks as more dangerous than men do. Other possible determinants of risk perception are, according to Dosman et al. (2001), the role in the household, the level of employment, and the number of children at home. Especially females who act as main meal planners were found to be highly concerned with food safety issues.

Furthermore, evidence exists for other possible determinants of risk perception. Hamilton (1985) found that children living at home influence both the risk perception of women and men. In case the children were living at home, food related risks were estimated to be higher than in the case the children were not living at home. Furthermore, the age of the children influences risk perception. As Hamilton (1985) pointed out, the younger children living at home, the higher were the risk estimations of food related risks. Another important determinant is the age of an individual. Krewski et al. (1994) found out that age of individuals and risk perception are positively correlated. Hence, older respondents estimate food related risks higher than younger respondents do.

Research Questions and Hypotheses

The literature research raised some interesting questions. First, I would like to investigate which variables are able to predict risk avoidance behavior and information seeking behavior in cases of a dioxin findings in food. The literature research has shown that there are already numerous of variables identified which influence risk avoidance and information seeking behavior. Therefore, the first research question is:

> *Which variables can explain risk avoidance behavior and information seeking behavior in case of dioxin findings in food?*

Thereby the following hypothesis is stated:

> Hypothesis 1: *The model as proposed in figure 1explains risk avoidance behavior and information seeking behavior.*

More particular, it is assumed that

> (a) risk avoidance behavior is significantly predicted by attitude towards changing eating behavior, relevance, and self-efficacy,
>
> (b) information seeking behavior is significantly predicted by information sufficiency and relevance,
>
> (c) anticipated regret correlates positively with the attitude towards changing eating behavior,
>
> (d) there is a strong positive correlation between self-efficacy and expectation,
>
> (e) authorities' management correlates positively with both risk perception and attitude towards changing eating behavior,
>
> (e) attitude towards changing eating behavior is mediating the relationship between risk avoidance behavior on the one hand and authorities' management, risk perception, anticipated regret, coping perception, and knowledge on the other hand,
>
> (f) information sufficiency mediates the relationship between information seeking behavior on the one hand and authorities management, risk perception, anticipated regret, coping perception, relevance and knowledge on the other hand

Second, it is interesting whether the observation that were made for risk perception, namely that women with small children report higher levels of risk perception also holds for risk

avoidance behavior and information seeking behavior. Therefore, the second research question is:

> *"Does the existence of children or the age of these children influence mothers' behavior in cases of dioxin findings in food?"*

As pointed out above, dioxin is especially risky for newborn children. However, due to the body burden, also young children face a high risk because due to their low weight even small amounts of dioxin intake can have negative consequences for the child. Therefore, the two following hypotheses are stated:

> Hypothesis 2: *There is a difference in risk avoidance behavior and information seeking behavior with regard to the three different groups.*

More particular, it is expected that

> (a) women with small children (younger than 16) score significantly higher on risk avoidance and information seeking behavior than the other two groups do and
> (b) women with children (older than 16) score significantly higher on information seeking and risk avoidance behavior than women without children do.

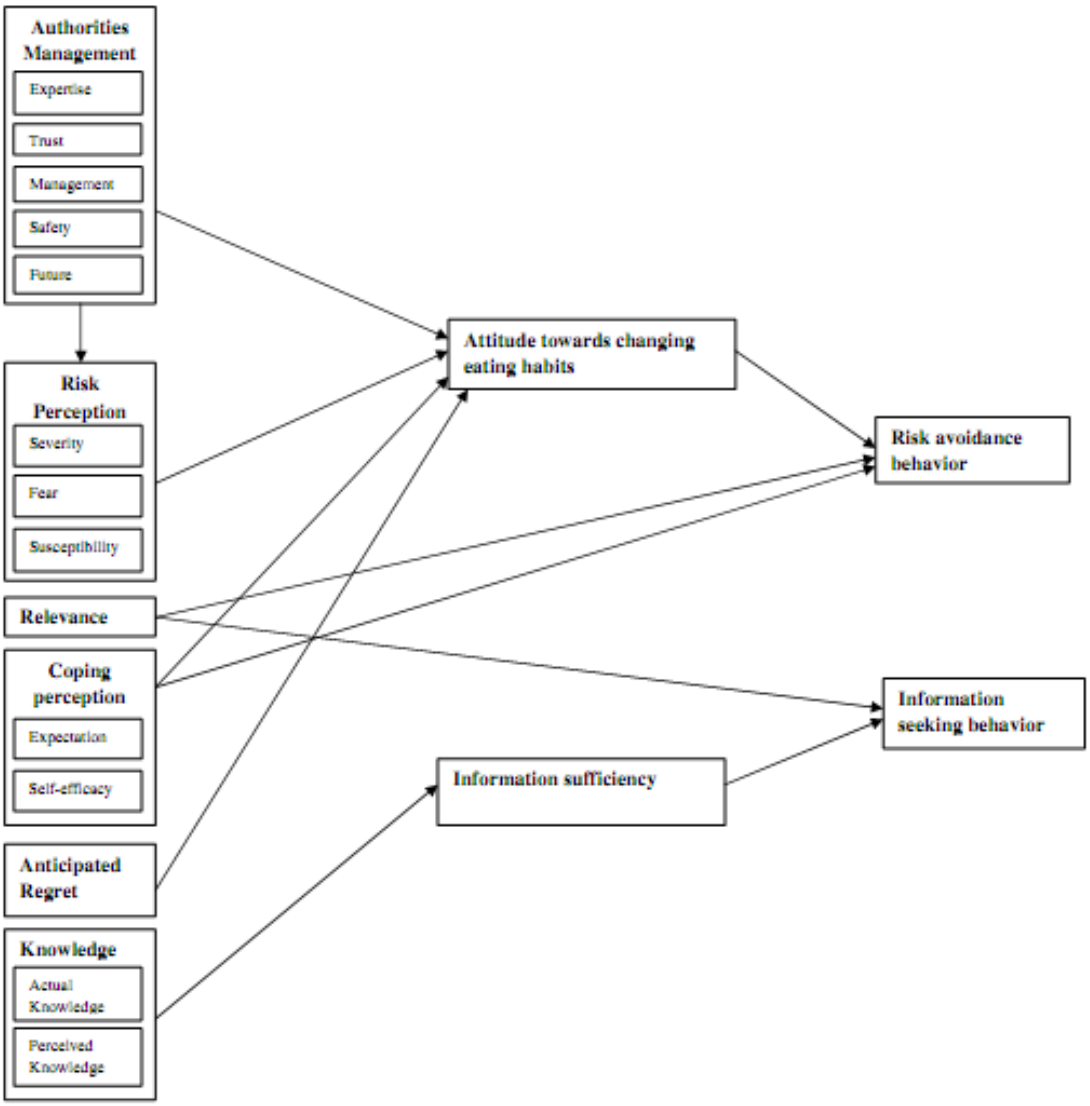
> Hypothesis 3: *The three groups score significantly different on the independent variables.*

Thereby, it is expected that

> (a) mothers with small children (younger than 16) score higher on the independent variables attitude, fear, severity, susceptibility, future, anticipated regret, relevance, actual knowledge, perceived knowledge, self-efficacy, expectation and information sufficiency than the two other groups
> (b) women without children score lower on the independent variables attitude, fear, severity, susceptibility, future, anticipated regret, relevance, actual knowledge, perceived knowledge, self-efficacy, expectation and information sufficiency than mothers with children.
> (c) mothers with small children (younger than 16) score lower on the independent variables management, safety, trust, and expertise than the two other groups do

(d) women without children score higher on the independent variables management, safety, trust and expertise than mothers with children.

Figure 1. *Proposed Model*



Methods

Design

A cross-sectional survey has been conducted. Potential respondents were contacted via mail including the link to the survey and the request to send the link to other women between 30 and 60 years of age. Thereby, the snowball technique has been used in order to reach potential respondents. An online survey has been used because this was the most efficient way to ask a considerable number of respondents a large number of structured questions.

Sample

The respondents in this study were 115 women between 30 and 60 years of age (mean age: 45.4 years). Fifty of these women had children under 16 living at home (42%), 32 women had children older than 16 (28%) and 33 of these women had no children (30%) (Table 1). The respondents took part in the survey on a voluntary basis. In total, 118 respondents participated part in the survey, however only 97 surveys were filled in completely (complementation rate: 82%) and two questionnaires were filled out by men and had therefore be excluded.

On average, the respondents had 1.5 children and they were living on average with three people in the household. Household size ranged from one person up to seven persons. Ninety-three percent of the respondents were mainly responsible for the purchase of groceries, and 80% were mainly responsible for the preparation of meals (mean days: 4.9). Therefore, it can be assumed that the respondents in the sample had to deal with the dioxin scandal because they were mainly responsible for choosing the food consumed by the family and preparing the meals. Only 14 respondents, thus 9% of the respondents, indicated that they have some special nutrition (e.g. vegetarian). On average, the households ate 3.2 times per week meat and 4.4 eggs per week (per complete household). These percentages are comparable with statistical data gathered in Germany, suggesting that the sample is representative of German women in this age group (Statistisches Bundesamt Deutschland, 2010; Statistisches Bundesamt Deutschland, 2011).

The sample has been divided in three different groups. The first group consisted of women with children younger than 16 (including children at the age of 16), the second group consisted of women with children older than 16 and the third group consisted of women without children. Table 1 shows the socio-demographic factors separately for the three groups.

Table 1. *Means (M) and percentages for the three different groups and significance of the difference between the three groups*

		Children under 16 (n= 50)		Children older than 16 (n= 32)		No children (n=33)		Total number (n= 115)		F-value
		Mean	Count	Mean	Count	Mean	Count	Mean	Count	
Age of the respondent		42		53		42		45		26.45**
Number of people in the household		4		3		2		3		45.06**
Number of children		2		2		0		1.5		73.34**
Times cooking per week		5		5		4		5		7.06*
Egg consumption per week		5		5		3		4		3.93*
Meat consumption per week		3		4		3		3		2.58
Special food	Yes		7 (14%)		3 (9%)		4 (12%)		14 (12%)	
	No		43 (86%)		29 (91%)		29 (88%)		101 (88%)	
Responsibility cooking	Myself		45 (90%)		27 (84%)		21 (64%)		93 (81%)	3.6*
	Husband		4 (8%)		3 (9%)		10 (30%)		17 (15%)	
	Other		1 (2%)		2 (6%)		2 (6%)		5 (4%)	
Responsibility shopping	Myself		48 (96%)		28 (87.5%)		31 (94%)		107 (93%)	0.31
	Husband		0 (0%)		3 (9%)		0 (0%)		3 (3%)	
	Other		2 (4%)		1 (3%)		2 (6%)		5 (4%)	

** = significant at a p= 0.001 level;
* = significant at a p= 0.05 level

Measures

The survey items have been developed by myself as there was no questionnaire available measuring the variables included in the model. The survey consisted of the different constructs that have been identified as important determinants of risk avoidance and information seeking behavior. The different items were measured by 5-point Likert-scales. The only exception has been the variable "actual knowledge" where only two answer possibilities have been given. All items consisted of a particular number of statements. The respondents had to indicate on a scale whether they totally agree with this statement or whether they totally disagree with the particular statement. When necessary for analysis, the items were rescaled. In Table 2, the different constructs, the number of items, Cronbach's alpha, the mean, and the standard deviation are given.

Table 2. *Cronbach's alpha (α), mean item score (M) and standard deviation (SD) of the different variables*

	No. of items	Cronbach's alpha	Range	Mean Item Score	Standard deviation
Dependent variables					
Risk avoidance behavior	11	.98	1-5	2.6	1.6
Information Seeking	6	.89	1-5	3.0	1.2
Independent variables					
Knowledge					
Actual knowledge	4	.57	1-4	2.6	1.0
Perceived knowledge	4	.85	1-5	3	1.1
Risk perception					
Fear	6	.97	1-5	3	1.2
Severity	8	.99	1-5	3.2	1.4
Susceptibility	5	.94	1-5	2.8	1.2
Authorities Management					
Management	3	.95	1-5	2.9	1.1
Trust	3	.96	1-5	2.8	1.2
Safety	3	.97	1-5	3.2	1.1
Expertise	3	.89	1-5	3.3	1.3
Future regulations	3	.98	1-5	3.5	1.5
Coping Perception					
Self-efficacy	5	.83	1-5	3.1	1.0
Expectation	4	.83	1-5	3.2	1.0
Anticipated Regret	4	.98	1-5	4.6	0.7
Relevance	4	.95	1-5	2.7	1.2
Information Sufficiency	4	.97	1-5	2.7	1.2
Attitude towards changing eating behavior	13	.97	1-5	2.9	1.2
Behavior of children	4	.88	1-5	3.6	

Cronbach's alpha is commonly used as an estimate of the internal consistency of a scale. In case the items highly correlate with each other, Cronbach's alpha will be high as well. Commonly, a Cronbach's alpha which is higher than 0.70 is considered as acceptable. A Cronbach's alpha higher than 0.90 indicates that the items are either too similar or that the respondents did not differentiate enough between the different items. This pattern will be further discussed in the discussion part of this study.

Risk avoidance behavior. The risk avoidance behavior has been measured with 11 different items (α=.98). Thereby, the respondents had to indicate how they behaved during the last dioxin scandal in January 2011 and how they would behave in the future. One of the items has been "I refrained from eating eggs during the dioxin scandal in January 2011".

Information Seeking Behavior. This item has been measured with six different items (α=.89). Here, the respondents had to report whether they executed information seeking

behavior during the last dioxin scandal and where they searched for their information. An example question for this variable is "I searched for additional information about dioxin in the internet".

Actual Knowledge. Four statements measured actual knowledge. The respondents had to indicate whether the statements were true or false. An example of one of these statements is "Dioxin can impair the immune system". In order to compare these items, an overall score of right answers has been calculated. When all items have been answered correctly, the respondent received four points. As shown in Table 2, on average the respondents got 2.6 correct answers.

Perceived knowledge. This construct has been measured with the 5-points-Likert scale described above. In total, four items were asked (α=.85). Thereby, the respondents had to estimate how much knowledge they have about dioxin. Thereby, statements such as "I know which foods are especially dangerous in regard to Dioxin" were asked.

Fear. This variable has been measured using six different statements (α=.97). The respondents had to indicate whether they are scared when thinking of dioxin, and whether they are afraid of falling ill because of dioxin. An example question for this variable is "I am afraid of dioxin in foods".

Severity. Eight statements were used to measure this variable, as for example "A dioxin contamination would have serious consequences for me". All the statements were concerned with possible consequences of dioxin and how severe they are as indicated by the respondents. The internal consistency was high with α=.99.

Susceptibility. Five different items measured susceptibility. These items dealt with the personal susceptibility of the respondents towards dioxin and the probability to fall ill because of the consumption of dioxin-contaminated foods. One of the questions was "I am prone to a dioxin contamination". The internal consistency was high as well with α=.94.

Management. Management included statements dealing with the satisfaction of the respondents with the management of the dioxin scandal of different authorities such as the government and food producers. Three items have been used to measure this construct (α=.95). An example statement is "The German government acted adequately during the dioxin scandal".

Trust. This construct has been measured by three different items (α=.96). It included statements concerned with trust in different kinds of authorities such as the government and food producers. An example statement for this construct is "Information given by the government in relation to dioxin is trustworthy".

Safety. The construct safety dealt with the respondents' perception of how safe food products are in general in Germany. It has been measured by three items as well (α=.97). An example statement is "Food in Germany is safe to eat".

Expertise. This construct has been measured by three items as well (α=.89). These three items dealt with the perceived expertise of authorities. Expertise has been measured by statements such as "The German food industry has enough expertise to properly assess the risk of dioxin".

Future Regulations. This construct has been measured by three items as well (α=.98). It includes items dealing with possible future consequences for authorities such as stricter control measures in the future. An example statement is "In my opinion, the food industry should be tightly controlled".

Self-Efficacy. This item dealt with the coping behavior of the respondents. The focus laid particular on the self-efficacy of the respondents. Thus, statements such as "I am able to protect myself against the consequences of dioxin" were asked. In total, five items measured this construct (α=.83).

Expectation. This construct is related to self-efficacy. In total, four items measured this construct (α=.83). The focus laid on the expectations of respondents when avoiding dioxin-contaminated foods. Thus, one of the statements was for example "Abstaining from eating eggs is good for my health".

Anticipated Regret. This variable has been measured by statements such as "I would regret my decision to eat eggs in case I would fall ill in the future". Therefore, it dealt with possible feelings of regret in the future concerning the respondent self and family and friends of the respondent. In total, this construct has been measured by four items (α=.98).

Relevance. This construct has been measured by four items as well (α=.95). The construct relevance included items where the respondents had to indicate whether dioxin is a problem for them personally, because of certain circumstances. An example is "Dioxin is a relevant problem for me because I eat eggs on a regularly basis".

Information sufficiency. This construct has been measured by four items (α=.97). This construct dealt with the amount of knowledge a respondent has, and whether the respondent regards her level of knowledge as sufficient. Thus, it includes items such as "My knowledge about dioxin is sufficient".

Attitude towards changing eating behavior. This construct has been measured by 13 items (α=.97). Thereby the focus laid on the attitude of the respondents towards avoiding

particular food to prevent illness. This construct has been measured by items such as "When I would stop eating eggs, I would be less afraid".

Behavior of children. Four additional questions were asked to women with children under the age of 16 living in the household. These questions were related to the behavior of their children during the dioxin scandal. An example question is "My child did not eat eggs during the dioxin scandal". The internal consistency was high as well with α=.88.

Data Analysis

Normality was tested using the variance inflation factor (VIF) for multicollinearity. The VIF did not exceed 10 for any of the variables indicating that there is no multicollinearity problem (Neter et al., 1996). The proposed model was tested with a correlation analysis. Bivariate correlation coefficients (Pearson) were calculated. It was tested whether the relationships between the different constructs correspond to the proposed model. These relationships were further analyzed with a stepwise regression analysis using backward elimination. Two independent regression analyses were conducted for the both dependent variables individually. The last two hypotheses were tested by a one-way between subject analysis of variance (ANOVA) whereby the different constructs the dependent variables were and the three groups the factor. All the differences between the groups were determined using post hoc Bonferroni multiple comparison procedures.

Results

Means of the Items

Table 2 shows the mean scores of the different variables. In general, most of the mean scores were around average (~3.0). The respondents reported levels of risk avoidance behavior slightly below average (*m*=2.6), while the reported level of information seeking behavior was about average (*m*=3.0). With respect to the determinants, it was found that the level of perceived knowledge was about average (*m*=3.0). The level of actual knowledge was quite high (*m*=2.6). The mean of 2.6 indicates that the respondents knew on average 2.6 right answers out of four possible right answers. The levels of fear (*m*=3.0), severity (*m*=3.2) and susceptibility (*m*=2.8) were around average. With regard to authorities' management it was found that the respondents had levels of trust in authorities (*m*=2.8) and levels of satisfaction with the management (*m*=2.9) that were slightly below average. Levels of belief in the expertise of these institutions (*m*=3.3), feelings of safety (*m*=3.2) and support for more restrictions in the future (*m*=3.5) were above average. Especially the level of support for more restrictions in the future is considerably high indicating that most respondents would like to have stricter rules concerning the food industry. Levels of self-efficacy (*m*=3.1) and expectation (*m*=3.2) were about average. The levels of anticipated regret were extremely high (*m*=4.6). The levels of relevance (*m*=2.7), information sufficiency (*m*=2.7) and attitude towards changing eating behavior (*m*=2.9) were again about average.

Risk avoidance behavior. Most respondents did not avoid eggs (53%) and pork meat (55%) during the dioxin incident in January 2011. When being asked for future behavior only 20% of the respondents indicated that they would avoid pork meat during this time, while 25% reported that they would avoid eggs in such a case.

Information seeking behavior. Most people read about dioxin in the newspaper (57%) or saw a report about dioxin on TV (45%). The need for searching additional information was considerably low. Only 28% of the respondents searched for more information themselves. Related to his, only 27% of the respondents indicated that they invested time in order to be able to estimate the risk of dioxin and only 37% of the respondents reported that they read the information about dioxin with interest.

Actual knowledge. Only 18% of the respondents knew that dioxin is absorbed by the fat tissue. The three remaining questions were correctly answered by around 80% of the respondents.

Perceived knowledge. Forty percent of the respondents indicated that they knew which food is especially dangerous with regard to dioxin. Furthermore, around 60% of the

respondents reported that they know the consequences of a high dioxin intake. At the same time, 60% of the respondents indicated that they did not know which group of persons faces particular dangers with regard to dioxin. A considerably high number of respondents indicated that they know what dioxin can cause in the body (68%).

Fear. In general, about half of the respondents were afraid of dioxin in food (48%). The percentage of respondents fearing long-term health consequences or short-term health consequences was equal (47%). Furthermore, 43% of the respondents feared to fall ill because of dioxin.

Severity. The consequences of a dioxin contamination were experienced as severe by 55% of the respondents. Forty-three percent of the respondents indicated that they do not expect to experience severe consequences after eating food contaminated with dioxin.

Susceptibility. Nearly half of the respondents indicated that they are susceptible for illnesses in relation with dioxin (49%). However, only 24% of the respondents indicated that they are sensitive to illnesses in relation with dioxin. A considerably high amount of respondents thought that it is unlikely to fall ill from dioxin even when consuming food contaminated with dioxin (61%).

Management. Nearly half of the respondents indicated that the government managed the dioxin scandal well (48%). However, both food producers (37%) and animal feeding stuff producers (36%) were according to the respondents less good in managing the dioxin scandal.

Trust. The levels of trust were more or less equal concerning the three different institutions (government, animal feeding stuff producers, food producers). Around 35% of the respondents indicated that they trust the government and the animal feeding stuff producers regarding their information about dioxin. Even more respondents indicated that they trust the information distributed by the food producers (46%).

Safety. In general, nearly forty percent of the respondents indicated that food in Germany is not safe to eat (37%). Most respondents did not have any concerns about the safety of food in German supermarkets (54%) and were sure that all food in Germany could be consumed without concerns (53%).

Expertise. Around half of the respondents believed that both the government (52%) and the food producers (51%) had enough expertise to correctly estimate the danger of dioxin. The percentage of respondents who believed that the animal feeding stuff producers had enough expertise was slightly higher (58%).

Future regulations. There is the need for more controls in the food production. Sixty-five percent of the respondents indicated that they would like to have more controls.

Furthermore, many respondents indicated that regulations for the food producers should be stricter (66%) and most respondents are in favor of severe punishment in cases of infringement of the law (65%).

Self-efficacy. Thirty-five percent of the respondents indicated that they could refrain from eating eggs for both a short-time period as well as a long-time period. Seventy-seven percent of the respondents were confident that they could prevent themselves from falling ill because of dioxin. However, only around 40% indicated that they are able to protect themselves from the consequences of dioxin (38%).

Expectation. Thirty percent of the respondents reported that they expect to be healthier when avoiding pork meat. Even more respondents expected to be healthier when avoiding eggs (55%). Fifty percent of the respondents expected that their fat tissue absorb less dioxin when avoiding pork meat and again, even more respondents expected that they absorb less dioxin when avoiding eggs (65%).

Anticipated regret. Around 90% of the respondents indicated that they would experience feelings of regret in case they fall ill because of dioxin. Furthermore, more than 90% of the respondents that they would experience feelings of regret in case that family members or friends fall ill because of dioxin (92%).

Relevance. More than half of the respondents indicated that dioxin was not a relevant problem for them (65%).

Information sufficiency. Less than half of the respondents indicated that they have enough knowledge about dioxin (46%). Even less respondents indicated that they have enough knowledge about the consequences of dioxin (37%). With regard to the information level, less than half of the respondents indicated that they have enough information about dioxin (39%). Only 36% of the respondents indicated that they have enough information about consequences of dioxin intake.

Attitude towards changing eating behavior. Only 35% of the respondents think that it makes sense to avoid eggs and pork meat. Thirty-four percent of the respondents indicated that they would like to eat less pork meat while more than the half of the respondents would like to decrease their egg consumption (54%). Nearly half of the respondents expected to be healthier when avoiding eggs (43%) while only 34% of the respondents expect to be healthier when avoiding pork meat. The same pattern has been appeared for questions concerned with the effect of pork meat and egg avoidance of other people. Forty percent of the respondents indicated that their friends and family members would be healthier when they would avoid pork meat and even more indicated that they would be healthier when they would avoid eggs

(48%). Only 32% of the respondents indicated that they would experience less feelings of fear when they would avoid eating pork meat. More than half of the respondents indicated that they would experience less feelings of fear when avoiding eggs (53%).

Behavior of children. Compared to the means of the other variables, the mean at this variable was considerable high with 3.6 (Table 2). Thirty-six percent of the mothers with children younger than 16 indicated that their children eat less eggs during the dioxin incident in January 2011. Even more mothers indicated that their children had restricted their pork meat consumption during this time (39%). Thirty-two respondents indicated that their children did not eat eggs at all during the dioxin incident. However, only 17 % indicated that their children avoided pork meat completely.

Relationship between Risk Avoidance Behavior, Information Seeking Behavior and the Proposed Variables

The first research question dealt with testing the proposed model. Table 3 shows the correlations of the different variables. All correlations are based on the means of the variables, except for the variable actual knowledge for which the sum of all right answers has been used. The correlations were calculated on basis of all respondents. Thus, there is no difference made for the three groups. In the following only correlations that are useful in order to evaluate the proposed model are discussed. The remaining correlations can be found in Table 3.

Both dependent variables, risk avoidance behavior and information seeking behavior, were found to be significantly interrelated (r=0.61). Furthermore, risk avoidance behavior was assumed to highly correlate with attitude towards behavior change. As illustrated in Table 3, this correlation was very high (r=.83). There was also a strong correlation between fear and risk avoidance behavior (r=.70). As proposed, relevance was highly correlated with risk avoidance behavior (r=.73). Furthermore, self-efficacy was expected to significantly correlate with risk avoidance behavior. This assumption was supported by the data (r=.65). Risk avoidance behavior was also correlated with all the other variables expect for anticipated regret (r=.08).

Information seeking behavior was hypothesized to highly correlate with actual knowledge, perceived knowledge, information sufficiency and relevance. As can be seen in Table 3, information seeking behavior and actual knowledge (r=.54), information seeking behavior and perceived knowledge (r=.74), information seeking behavior and information sufficiency (r=.76) and information seeking behavior and relevance (r=.71) were significantly correlated.

Table 3. *Correlations between the different variables*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 Risk Avoidance Behavior	1,000																	
2 Information Seeking Behavior	,613**	1,000																
3 Actual Knowledge	,525**	,543**	1,000															
4 Perceived Knowledge	,319**	,737**	,497**	1,000														
5 Fear	,704**	,663**	,543**	,397**	1,000													
6 Severity	,641**	,544**	,535**	,251**	,883**	1,000												
7 Susceptibility	,645**	,523**	,515**	,261**	,825**	,875**	1,000											
8 Management	-,557**	-,609**	-,526**	-,330**	-,717**	-,711**	-,718**	1,000										
9 Trust	-,545**	-,534**	-,571**	-,309**	-,682**	-,751**	-,777**	,845**	1,000									
10 Safety	-,586**	-,637**	-,447**	-,326**	-,686**	-,634**	-,600**	,722**	,714**	1,000								
11 Expertise	-,562**	-,492**	-,518**	-,300**	-,665**	-,632**	-,626**	,735**	,735**	,673**	1,000							
12 Future Regulations	,610**	,539**	,461**	,232**	,750**	,823**	,751**	-,801**	-,799**	-,692**	-,640**	1,000						
13 Self Efficacy	,654**	,534**	,390**	,323**	,611**	,642**	,542**	-,553**	-,536**	-,613**	-,455**	,661**	1,000					
14 Expectation	,666**	,588**	,406**	,324**	,623**	,595**	,511**	-566**	-,496**	-,604**	-,465**	,626**	,878**	1,000				
15Anticipated Regret	,078	,291**	,249**	,383**	,132	,013	,103	-,076	-,075	-,027	-,047	-,085	,023	,169*	1,000			
16 Relevance	,726**	,707**	,572**	,427**	,764**	,676**	,696**	-,701**	-,679**	-,595**	-,588**	,671**	,479**	,556**	,117	1,000		
17 Information Sufficiency	,315**	,761**	,447**	,809**	,372**	,181*	,256**	-,347**	-,233**	-,339**	-,311**	,148	,199*	,294**	,408**	,467**	1,000	
18 Attitude towards changing eating behavior	,826**	,675**	,489**	,425**	,735**	,623**	,598**	-,598**	-,546**	-,617**	-,553**	,637**	,660**	,731**	,157	,773**	,414**	1,000

**. Correlation is significant at the 0.01 level (1-tailed).

*. Correlation is significant at the 0.05 level (1-tailed).

Furthermore, it had been hypothesized that variables related to authorities' management are highly correlated with risk perception as well as attitude towards changing eating behavior. This assumption was supported by the data as well. Management, trust, safety, and expertise were negatively correlated with all relevant variables, thus with fear, severity, susceptibility as well as attitude towards changing eating behavior. Future was positively related with all the four variables.

Anticipated regret was assumed to correlate with attitude towards changing eating behavior. This assumption was not confirmed. Anticipated regret did not correlate significantly with attitude towards changing eating behavior (r=.16).

Because it had been hypothesized that attitude towards changing eating behavior act as a mediator between the different variables and risk avoidance behavior, the correlations between the different variables and attitude towards changing eating behavior were analyzed as well. It was found that all variables, except for anticipated regret, significantly correlated with attitude towards changing eating behavior (see Table 3). The same observation has been made for information sufficiency and the independent variables. In this case, only future regulations had been found to be not significantly correlated with information sufficiency.

Regression Analysis

The model assumes that scores on the different independent variables can predict risk avoidance and information seeking behavior. In the first regression analysis, information seeking behavior has been used as the dependent variable and the other variables as proposed in figure 1 have been used in the stepwise regression analysis as independent variables. The variables perceived knowledge, safety, expectation, relevance and information sufficiency were found to be significantly predicting information seeking behavior. Taken together, they could predict 81.8% (R^2=.818) of information seeking behavior. All five variables add significant predictive value to the model (see Table 4).

Table 4. *Results of the backward regression analysis with information seeking behavior as dependent variable*

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	,647	,409		1,582	,117
	Perceived Knowledge	,291	,092	,248	3,166	,002
	Safety	-,217	,059	-,223	-3,670	,000
	Expectation	,144	,070	,121	2,061	,042
	Relevance	,239	,063	,231	3,786	,000
	Information Sufficiency	,358	,087	,334	4,132	,000

a. Dependent Variable: Information Seeking Behavior

Furthermore, it has been proposed that information sufficiency mediates the relation between the independent variables and information seeking behavior. To test this mediation, another backward regression analysis was executed without including information sufficiency. As shown in Table 5 perceived knowledge, trust, safety, relevance and management were identified as the variables best predicting information seeking behavior. Only trust and management had not been found as predictors when including information sufficiency as mediator. Management was not significant predicting information seeking behavior. Therefore, it has not been further analyzed. For the variable trust, however, it was analyzed whether information sufficiency mediates between trust and information seeking behavior. All the mediator analyses follow the four steps as proposed by Baron and Kenny (1986).

Table 5. *Results of the backward regression analysis with information seeking behavior as dependent variable (information sufficiency was not included in the analysis)*

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1,121	,433		2,589	,011
	Perceived Knowledge	,589	,063	,502	9,361	,000
	Trust	,199	,097	,194	2,053	,043
	Safety	-,281	,071	-,290	-3,949	,000
	Relevance	,333	,074	,321	4,470	,000
	Management	-,187	,106	-,172	-1,762	,081

a. Dependent Variable: Information Seeking Behavior

The first step has been the assessment of whether trust could significantly predict information seeking behavior. In the next step, it was tested whether trust could significantly predict the possible mediator information sufficiency. Trust could predict information sufficiency [β=.39, $t(95)= 3.56$, $p=.001$]. In the next step, it was tested whether the mediator information sufficiency could predict information seeking behavior when controlling for trust. This was found to be the case [β=.32, $t(91)=3.829$, $p<.001$]. In the last step, it was analyzed whether trust was still significantly predicting information seeking behavior after including the mediator in the model. Trust did not significantly predict information seeking behavior anymore [β=.096, $t(91)=0.746$, $p=.457$], indicating that information sufficiency was mediating the relation between trust and information seeking behavior.

The variables identified in the first regression analysis (table 4) were further analyzed as well because it was expected that information sufficiency was at least partly mediating the relation between perceived knowledge, safety, relevance and expectation.

It was found that perceived knowledge significantly predicted information seeking behavior [β=.74), $t(104)=11.05$, $p<.001$]. Furthermore, women who reported higher levels of perceived knowledge also reported higher levels of information sufficiency [β=.81, $t(108)=14.22$, $p<.001$]. Besides, the level of information sufficiency predicted the level of information seeking behavior, when controlling for levels of perceived knowledge [β=.48, $t(104)=4.69$, $p<.001$]. Finally, the level of perceived knowledge predicted information seeking behavior less strongly with the level of information sufficiency included than without it [β=.35, $t(104)=3.48$, $p=.001$]. The standardized beta value was considerably lower for the relation between perceived knowledge and information seeking behavior when including the mediator variable information sufficiency. The decrease indicates that information sufficiency partly mediates the relationship.

Relevance [β=.71, $t(96)= 9.8$, $p<.001$], safety [β=-.64, $t(97)=-8.1$, $p<.001$] and expectation [β=.59, $t(96)=7.1$, $p<.001$] were found to significantly predict information seeking behavior. Furthermore, relevance [β=.47, $t(99)=5.26$, $p<.001$], safety [β=-.34, $t(100)=-3.6$, $p<.001$] and expectation [β= .29, $t(99)=3.06$, $p=.003$] were found to significantly predict the proposed mediating variable information sufficiency. Information sufficiency was still significantly predicting information seeking behavior even when controlling for relevance [β=.57, $t(95)=9.5$, $p<.001$], safety [β=.63, $t(96)=11.45$, $p<.001$] and expectation [β=.65, $t(95)=11.43$, $p<.001$]. The beta value for these variables decreased when adding information sufficiency to the model. This indicates that the information sufficiency is indeed partly

mediating the relation between information seeking behavior on the one hand and relevance (β=.43**), safety (β=-.41**) and expectation (β=.37**) on the other hand.

In the second regression analysis, risk avoidance behavior was used as dependent variable. Again, all variables proposed in figure 1 has been used as independent variables. As illustrated in Table 6, only actual knowledge, self-efficacy and attitude towards changing eating behavior were found to significantly predict risk avoidance behavior. The three variables combined can predict 71.9% of risk avoidance behavior.

Table 6. *Results of the step-done regression analysis with risk avoidance behavior as dependent variable*

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	-2,124	,705		-3,014	,003
	Actual Knowledge	,216	,108	,141	1,997	,049
	Self Efficacy	,290	,112	,193	2,591	,011
	Attitude towards changing eating behavior	,693	,127	,525	5,471	,000

a. Dependent Variable: Risk Avoidance Behavior

Furthermore, it has been hypothesized that attitude serves as a mediating variable between the independent variables and the dependent variable risk avoidance behavior. In order to test this assumption, a backward regression analysis has been executed with risk avoidance as dependent variable and all variables used before as independent variable. Only attitude has been excluded from the independent variables as it has been entered in a second step. Without adding attitude to the model, relevance [β=.49, $t(94)=5.63$, $p<.001$], susceptibility [β=.21, $t(94)=2.04$, $p=.044$], trust [β=.36, $t(94)=2.55$, $p=.012$], expertise [β=-.18, $t(94)=-2.1$, $p=.039$] and self-efficacy [β=.38, $t(94)=5.63$, $p<.001$] were found to significantly predict risk avoidance behavior.

Furthermore, it was tested whether these four variables could significantly predict the mediator attitude towards changing eating behavior. It was found that only relevance could predict attitude [β=.68, $t(95)=7.23$, $p<.001$]. In the next step, it was analyzed whether the mediator attitude towards changing eating behavior could predict the dependent variable risk avoidance behavior when controlling for relevance. Attitude towards changing eating behavior was still significantly predicting risk avoidance behavior [β=.61, $t(94)=6.92$,

$p<.001$]. The significance of relevance, however, vanished when adding the mediator to the model [$\beta=.12$, $t(94)=1.24$, $p=.219$]. This indicates that attitude mediates the relationship between relevance and risk avoidance behavior.

Influence of Socio-Demographic Factors

As has been indicated in the introduction of this study, several socio-demographic factors have been found to influence risk avoidance behavior. In the following paragraph, the correlations between socio-demographic variables and variables included in this study are presented. When there is no *p*-value indicated, the correlation is significant at the $p= .001$ level. Otherwise, the *p*-value is mentioned.

The number of children is significantly correlated with risk avoidance behavior ($r=.24$, $p=.008$), information seeking behavior ($r=.41$), and all other variables expect for anticipated regret ($r=.12$, $p=.13$). Management ($r=-.39$), trust ($r=-.42$), expertise ($r=-.28$) and safety ($r=-.33$) were the only variables negatively correlated with number of children. Thus, the more children a mother has, the more risk avoidance and risk information seeking behavior a mother executes. Furthermore, the more children a mother has, the more fear she experience when thinking about dioxin ($r=.35$), the more vulnerable she feels to possible consequences of dioxin ($r=.40$), the more severe she estimates the consequences of dioxin ($r=.38$) and the more relevant she experiences dioxin ($r=.37$). In addition, there is a significant correlation between the number of children and actual ($r=.43$) and perceived knowledge ($r=.28$, $p=.002$). Thus, women with more children know more about dioxin and they also think that they know more about dioxin. Furthermore, they have the expectation that they will not suffer from the consequences of dioxin when they avoid the consumption of dangerous products ($r=.20$, $p=.021$).

The age of respondents was significantly correlated with the variable relevance. The older the respondent, the lower levels of relevance were reported. This supports the choice of the age frame. Other articles pointed out that older people generally estimate risks as higher than younger people do (Krewski et al., 1994). The chosen age frame (30 years up to 60 years) seems to be quite homogenous with regard to risk avoidance behavior and information seeking behavior, because the exact age did not correlate with any of the variables.

When considering the age of the children living in the household, only some of the variables were significantly related to the age of the children. Women with older children reported less concerns about the future security measures to control the food production ($r=-.36$), they indicate higher levels of trust in the expertise of relevant institutions ($r=.29$),

they have lower outcome expectancies (r=-.27, p=.05), they show lower levels of fear (r=-.31), they exhibit lower levels of susceptibility (r=-.78), and they have a more negative attitude concerning behavior changes (r=-.29) and they show less risk avoidance behavior (r=-.34).

In order to answer the question whether the age of the children influences risk avoidance behavior, the correlation between the age of the children and risk avoidance behavior has been calculated. In order to be able to compare only actual children, the variable "Age of the youngest person in the household" was limited to the age frame 0 until 18. When calculating the correlation between this variable (children aged 0 until 18) and risk avoidance behavior, it was found that there was indeed a significant negative correlation (r=-.42, p=.002).

Differences Between the Groups

As shown in Table 7, there have been differences found with regard to every variable, except for anticipated regret. The exact differences are analyzed in the following paragraph.

Risk avoidance behavior. According to the first hypothesis, there should be a difference in risk avoidance behavior across the three different groups. Furthermore, it was expected that women with children under 16 executed more risk avoidance behavior than women with older children. Both groups were expected to execute more risk avoidance behavior than women without children did. Table 7 shows that there was indeed a difference between the three different groups. The differences between the three groups were significant [F(2,97)=16.43, p=.001]. The subsequent Bonferroni analysis revealed that only the difference between women with small children (m=3.26, SD=1.5) and women without children (m=1.96, SD=1.49) is significant. Women with small children executed higher levels of risk avoidance behavior compared to women without. Both groups did not differ significantly from women with children older than 16 (m=2.39, SD=1.29). However, it could be possible that the difference between women with younger children and women with older children is significant in other samples because the p-value nearly reached significance (p=.056).

Table 7. *Means and standard deviations for each group and results of ANOVA*

	Under 16		Older than 16		No children		Difference		
Variable	M	SD	M	SD	M	SD	F	Df	p
Risk Avoidance Behavior	3.26	1.51	2.39	1.29	1.96	1.49	7.785	2.99	.001
Information Seeking Behavior	3.70	1.16	2.88	.98	2.04	.78	25.669	2.104	.000
Actual Knowledge	2.90	.85	2.72	.70	1.94	1.12	11.688	2. 110	.000
Perceived Knowledge	3.30	1.12	3.06	.93	2.54	.95	5.414	2.110	.006
Fear	3.50	1.12	3.25	1.13	2.14	1.00	15.175	2.99	.000
Severity	3.71	1.08	3.63	1.34	2.27	1.19	15.512	2.99	.000
Susceptibility	3.21	1.06	3.01	1.14	1.96	.96	13.922	2.99	.000
Management	2.33	.97	2.94	1.00	3.62	1.02	15.570	2.101	.000
Trust	2.32	1.05	2.51	1.06	3.60	1.07	14.679	2.101	.000
Safety	2.60	1.14	3.33	1.16	4.01	1.09	14.500	2.101	.000
Expertise	2.91	1.06	3.19	.99	3.73	.94	6.268	2.101	.003
Future Regulations	4.16	1.01	3.86	1.41	2.42	1.56	17.561	2.101	.000
Self Efficacy	3.42	.96	3.16	.91	2.70	1.08	4.937	2.100	.009
Expectation	3.66	.78	2.90	.99	2.68	1.11	11.047	2.100	.000
Anticipated regret	4.75	.53	4.53	.74	4.38	.87	2.632	2.99	.077
Relevance	3.47	1.12	2.52	1.03	1.89	.67	25.15	2.100	.000
Information Sufficiency	3.18	1.22	2.59	1.06	2.24	1.03	7.109	2.108	.001
Attitude towards changing eating behavior	3.52	1.15	2.65	.82	2.30	1.07	13.467	2.99	.000

$p < 0.05$: significant difference between the three groups were found

Information Seeking Behavior. The average level of information seeking behavior reported by the respondents was about average (m=3.0). However, it was hypothesized that women with children under 16 reported the highest level of information seeking behavior, followed by women with older children and women without children were expected to report the lowest level of information seeking behavior. The ANOVA showed that there was a significant effect of the group on levels of information seeking behavior [$F(2,102)=25.67, p<.001$]. Post hoc comparison using the Bonferroni test indicated that the mean score for women with young children (m=3.7, SD=1.15) differ significantly from both women with older children (m=2.88, SD=0.98) and women without children (m=2.04, SD=0.78). The difference between women with older children and women without children was significant as well. Women with small children reported higher levels of information seeking behavior compared to both mothers with older children and women without children.

Furthermore, women without children reported significantly lower levels of information seeking behavior then women with older children.

Actual Knowledge. With regard to actual knowledge it could be concluded that in general, the respondents seemed to know enough about dioxin (m=2.6). Again, the differences between the three groups were significant [$F(2,108)=11.69$, $p<.001$]. Again, it has been hypothesized beforehand that women with younger children has the highest levels of actual knowledge while women without children have the lowest level of actual knowledge. The post hoc test showed that there is no difference between women with young children (m=2.9, SD=0.85) and women with older children (m=2.7, SD=0.70). However, the differences between these two groups and women without children (m=1.94, SD=1.11) were significant at the p=.05 level indicating that women without children knew less about dioxin.

Perceived Knowledge. With regard to perceived knowledge, the three groups differed as well, $F(2,108)=5.41$, p=.006. There was only a significant difference between women with young children and women without children (m=2.54, SD=0.95, $p<.005$). Women with small children estimated their own knowledge about dioxin greater than women without children do. Women with older children (m=3.06, SD=0.93) did not differ significantly from the other groups with regard to levels of perceived knowledge.

Fear. The level of fear was in general about average (m=3). It was hypothesized that women with children under 16 score significantly higher on the variable fear than the two other groups. There was a significant difference, $F(2,97)=15.18$, $p<.001$, between the three groups. However, only the difference between women without children (m=2.14, SD=0.99) and the two other groups ($p<.001$) was significant. Women with young children (m=3.49, SD=1.12) and women with older children (m=3.25, SD=1.13) did not significantly differ in their level of fear. The results indicate that women with children in general report higher levels of fear compared to women without children. The age of the children did not seem to influence the level of fear. This was supported by a correlation analysis between the age of children (0 until 20 years of age) and levels of fear (r=-.27, p=.072, one-tailed).

Severity. The level of severity indicated by the respondents was also about average (m=3.2). Again, it had been hypothesized that women with children under 16 experience the highest levels of severity. Significant differences between the groups were found, $F(2,97)=15.51$, $p<.001$. Women without children reported very low levels of severity (m=2.27, SD=1.19), while the two other groups reported both high levels of severity (m=3.71, SD=1.08 for women with children under 16 and m=3.63, SD= 1.34 for women with children older than 16, respectively). The results indicate that women with children judge the severity

of dioxin as higher than women without children do. Again, the age of the children did not seem to influence the level of severity that was reported (r=-.15, p=.150).

Susceptibility. The level of susceptibility was rated below average (m=2.7). The same pattern as with fear and severity could be observed again. The three groups differed significantly at the p=.001 level with $F(2,97)$=13.92. Again, only the difference between women without children and the two other groups was significant indicating that women without children feel less susceptible to illnesses in relation with dioxin than mothers do.

Management. It was hypothesized that women with small children report lower levels of satisfaction with authorities' management. When comparing the average levels of satisfaction with authorities' management for the three groups (Table 7), there was a significant difference found, $F(2,100)$= 15.51, p<.001. The average level of satisfaction with the management for women with children under 16 was m=2.33, for women with older children it was m=2.94 and for women without children it was m=3.62. The post hoc test revealed that each group differed significantly from both others. The difference between women with small children and women with older children was significant at p=.05 level, the difference between women with small children and women without children was significant at p<.001 level and the difference between women with older children and women without children was significant at the p= .05 level. Women with small children had the lowest scores on this variable, while women without children had the highest scores. A correlation analysis showed that the age of the children and satisfaction with the management of authorities is positively correlated (r=.23, p=.049, one-tailed). Thus, the older the children the more satisfaction with the management of authorities was reported.

Trust. Considering the variable trust, it was hypothesized that women with smaller children report lower levels of trust. As can be seen in Table 7, the means for the three groups were different. This differences was significant $F(2,99)$=14.68 at the p=.001 level. Women without children (m= 3.6, SD= 1.07) reported significant higher levels of trust in authorities compared to both women with older children (m= 2.51, SD= 1.06, p=.001) and women with younger children (m= 2.32, SD= 1.05, p<.001).

Safety. It has been hypothesized that women with children younger than 16 report the lowest levels of trust in the safety of products in Germany, followed by women with older children and women without children. When only considering the means of the different groups, this hypothesize was supported. The average level of trust in the safety of products was m= 2.6 (SD=1.14) for women with children under 16, m=3.33 (SD=1.16) for women with children older than 16 and m=4.01 (SD=1.09) for women without children. This difference

was significant, $F(2,99)=14.5$, $p<.001$. The post hoc test showed that the difference between women with children younger than 16 and women with older children was significant at the $p=.05$ level. The difference between women with children and women without children was significant at the $p=.001$ level. The difference between women without children and women with children older than 16 was not significant ($p=.074$). Women with small children had therefore the least trust in the safety of food in Germany, while mothers with older children and women without children reported higher trust.

Expertise. With regard to the variable expertise, it had been hypothesized that women with smaller children indicate that the different institutions have lower levels of expertise, compared to women with older children and women without children. As can be seen in Table 7, the reported means support this hypothesis. The ANOVA showed that the difference between the three groups was indeed significant, $F(2,99)= 6.268$, $p=.003$. Post hoc analysis showed that only women with children younger than 16 and women without children significantly differ from each other ($p=.002$) with women with small children indicating significantly less trust in the expertise of authorities in cases of food contamination.

Future regulations. It was hypothesized that women with children younger than 16 would be more in favor of strict control systems in the future in order to prevent such food scandals. Furthermore, it was expected that women without children would score lowest on this variable. Again, this pattern was supported by the means for the separate groups. ANOVA revealed that the difference between the three groups was significant, $F(2,99)=17.56$, $p<.001$. The post hoc test showed that only the difference between mothers without children and mothers with children was significant, for both groups at the $p=.001$ level. The difference between mothers with older children and mothers with smaller children was not significant ($p=1.000$) indicating that the age of the children does not influence the variable future control. However, when calculating the correlation between future control and age of children only taking into account children until the age 20, there was a significant negative correlation between the two variables ($r=-.25$, $p=.036$) indicating that the younger the children, the more in favor for stricter control mechanisms the women were.

Self-Efficacy. With regard to self-efficacy it was expected that women with children younger than 16 indicate the highest level of self-efficacy, while women without children indicate the lowest level of self-efficacy. Women with children younger than 16 indicated levels of self-efficacy higher than average ($m=3.42$, $SD=.96$), women with children older than 16 indicated around average ($m=3.16$, $SD=.91$) and women without children report levels of self-efficacy slightly below average ($m=2.70$, $SD=1.08$). ANOVA showed that the difference

between the three groups were significant, $F(2,99)= 4.937$, $p=.009$. However, only the difference between women without children and women with children younger than 16 was significant ($p=.007$) when conducting the post hoc test.

Expectation. For the variable expectation, the same pattern as for self-efficacy was hypothesized. Women with small children were expected to report higher levels of positive expectations when avoiding foods prone to dioxin. ANOVA showed that the difference between the three groups was significant, $F(2,99)=11.047$, $p<.001$. The post hoc test revealed that the difference between women with children under 16 and women with older children was significant ($p=.006$) and that the difference between women with younger children and women without children was significant ($p<.001$). Women with older children and women without children did not differ in their level of expectation. Women with small children reported therefore higher levels of expectation in comparison to women with older children and women without children.

Anticipated regret. It was hypothesized that women with children younger than 16 report the highest level of anticipated regret, whereas women without children report the lowest level of anticipated regret. This patter can also be seen in Table 7. An ANOVA, however, revealed that the differences between the three groups were not significant, $F(2,97)=2.63$, $p=.077$. Contrary to expectation, the groups reported similar levels of anticipated regret, indicating that regret is not a useful variable to explain behavior differences in women with children and without children.

Relevance. It was expected that women with children younger than 16 would indicate higher level of relevance due to the risk posed to their children. Women without children were again expected to report the lowest level of relevance. The means of the different groups support the hypothesis. While women with children younger than 16 reported an about average level of relevance ($m=3.47$, $SD=1.12$), women with children older than 16 reported level of relevance that were about average ($m=2.52$, $SD=1.03$) and women without children reported very low levels of relevance ($m=1.89$, $SD=.67$). The ANOVA confirmed the presumption and showed that the difference between the groups is significant, $F(2, 98)=25.52$, $p<.001$. Post hoc analysis showed that both the difference between women with children younger than 16 and the women with children older than 16 and the difference between women with small children and women without children was significant at the $p=.001$ level. The difference between women with children older than 16 and women without children was significant as well at the $p=.05$ level. This indicated that women with small children report the

highest levels of relevance compared to both other groups and that women without children report the lowest levels of relevance.

Information sufficiency. It was hypothesized that women with children younger than 16 indicate higher levels of information sufficiency, because it was assumed that people who engage in more information seeking behavior have more knowledge and have therefore a higher level of information sufficiency. Women without children were hypothesized to indicate the lowest level of information sufficiency. When considering the means of the different groups, this hypothesis is supported. Women with children younger than 16 reported levels of information sufficiency slightly above average (m=3.18, SD=1.22) while women with children older than 16 reported levels of information sufficiency slightly lower than average (m=2.59, SD=1.06) and women without children report levels considerably lower than average (m=2.24, SD=1.03). ANOVA reveals that there is a significant difference between the three groups, $F(2,106)=7.11$, $p=.001$]. Multiple comparison showed that only the women without children and women with children younger than 16 differ significantly with regard to this variable ($p=.001$).

Attitude towards changing eating behavior. With regard to the attitude it was expected that women with children younger than 16 indicate the most positive attitudes towards changing the eating behavior. Women without children were expected to indicate the least positive attitudes towards changing the eating behavior. The means in Table 7 shows that especially women with children younger than 16 indicated high levels of positive attitudes as has been expected (m=3.52, SD=1.15). ANOVA shows that the difference between the groups was significant, $F(2,97)=13.47$, $p<.001$. The multiple comparison showed that the difference between women with children younger than 16 and women with children older than 16 was significant ($p=.004$). Furthermore, women with small children and women without children significantly differed from each other with regard to their attitudes ($p<.001$).

In sum, the comparison of the three groups under consideration showed that there are indeed differences between the groups with regard to the proposed variables. Especially women without children differed on nearly all variables from women with children and in particular from women with small children. The women with older children were snared between the two other groups and were sometimes more closely related to women with small children and sometimes with women without children.

Discussion

This study aimed at answering two research questions. The first research question was "*Which variables can explain risk avoidance behavior and information seeking behavior in case of dioxin findings in food?*". Thereby, a model (figure 1) has been proposed including variables from available research literature and common models such as the protection motivation theory. It had been hypothesized that this model explains risk avoidance behavior and information seeking behavior in cases of dioxin in food.

The first assumption that risk avoidance behavior is significantly predicted by attitude towards changing eating behavior, relevance and self-efficacy was found to be only partly confirmed. Correlation analysis showed that all three variables are positively correlated with risk avoidance behavior. However, the backward regression analysis showed that only actual knowledge, self-efficacy and attitude towards changing eating behavior significantly predicted risk avoidance behavior. This was unexpected because existing literature and risk avoidance models did not indicate a direct relationship between actual knowledge and risk avoidance behavior. The importance of actual knowledge could have arisen due to the particular topic. As indicated by the study of Kennedy et al. (2010), dioxin is a very vague topic for most people, and possible risks are hard to estimate for the lay public. Therefore, actual knowledge, thus the knowledge people actually had and not the knowledge they thought to have is important to decide whether it is necessary to avoid eggs and pork meat or whether the risks of dioxin are too low for avoiding eggs and pork meat to make any sense. The finding that self-efficacy directly influences risk avoidance behavior supports the study carried out by Milne et al. (2000). They found that especially self-efficacy has a strong and robust correlation with the intention to behave as well as with actual behavior. The finding in this study is therefore in line with the observation made by Milne et al.

As expected, attitude towards changing eating behavior has been highly correlated with risk avoidance behavior and it has been also found to significantly predicting risk avoidance behavior. This supports the findings of various authors who repeatedly indicated the close linkage between attitude and actual risk avoidance behavior (e.g. Lobb et al., 2006; Conner & Norman, 2005).

Furthermore, it had been hypothesized that attitude towards changing eating behavior mediates between risk avoidance behavior on the one hand and authorities' management, risk perception, anticipated regret, coping perception, and knowledge on the other hand. All variables correlated with attitude towards changing eating behavior as well as with risk avoidance behavior, except of anticipated regret. Further analysis identified relevance as

being a significant predictor of risk avoidance as well; however, the relation was completely mediated by attitude towards changing behavior. This had not been expected. As stated in the first hypothesis, relevance has been expected to be directly related to risk avoidance behavior. However, this assumption has been based on a theoretical review of Ruiter et al. (2001). Therefore, there is the possibility that relevance is significantly predicting risk avoidance behavior in general but not in the case at hand. The low number of variables mediated by attitude towards changing eating behavior is contrary to common scholarly wisdom. Several authors point out the mediating role of attitude in various areas of application (e.g. Milne et al., 2000; Hodgkins & Orbell, 1998).

Secondly, it had been hypothesized that information seeking behavior is significantly predicted by information sufficiency and relevance. The other variables have been assumed to be mediated by information sufficiency. These hypotheses were only partly confirmed. The variables perceived knowledge, safety, expectation, relevance and information sufficiency have been found to significantly predict information seeking behavior. Thus, in addition to the two proposed variables, relevance and information sufficiency, perceived knowledge, safety and expectation are significant predictors of information seeking behavior. In addition, trust was found to significantly predicting risk avoidance behavior; however, it was completely mediated by information sufficiency.

Griffin et al. (1999) proposed that people mainly engage in effortful information seeking when the faced risk is personal relevant and when they feel that they need more information than they currently have. This is only partly in line with the findings I obtained. Both, Griffins et al. (1999) and my findings support the fact that a problem needs to be personally relevant to individuals in order to motivate people to engage in systematic information seeking behavior. However, contrary to the findings of Griffin et al. (1999), in the case at hand women who reported higher levels of perceived knowledge have been more engaged in information seeking behavior. Griffin et al. (1999) found that individuals are more motivated to engage in information seeking behavior in case they think that their knowledge is too limited. This pattern needs to be clarified in subsequent research. Common sense favor Griffins et al. (1999) findings. However, there is need to analyze this aspect more closely under different circumstances in order to draw more valid conclusions.

Thirdly, it had been hypothesized that anticipated regret correlates positively with the attitude towards changing eating behavior. This hypothesize was not supported by the data.

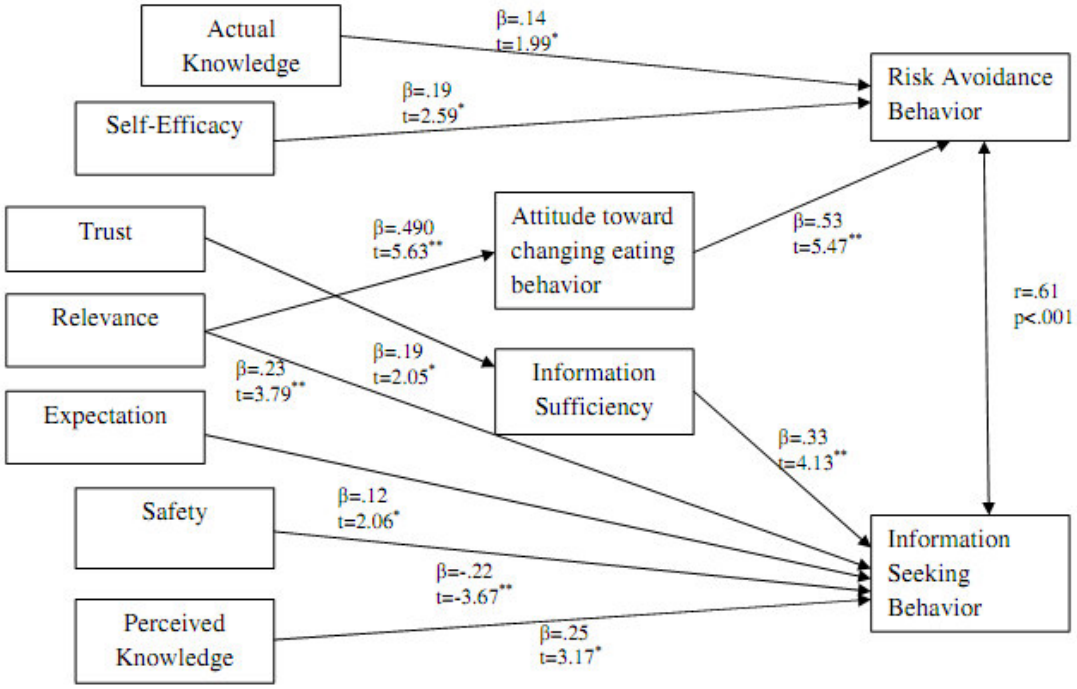
The strong positive correlation between self-efficacy and expectation could be found in the study at hand as well. This supports Kuttschreuter's (2006) finding. The advice to

combine self-efficacy and expectation in a single variable seems to be a valuable advice at least in relation to food related risks.

Furthermore, it has been hypothesized that authorities' management correlates with both risk perception and attitude towards changing eating behavior. The data supported this hypothesis. Management, trust, safety and expertise were all negatively correlated with fear, susceptibility, severity and attitude towards changing eating behavior. Furthermore, future was found to correlate positively with all the variables. This finding is therefore in line with the research by Kennedy et al. (2010) as well as with the research by Lobb et al. (2006).

The following figure (figure 2) summarizes the results of the regression analyses and states the predictive power of the different variables indicated by the standardized beta values.

Figure 2. *Final Model*



**= t- value is significant at *p*=.001 level
*= t-value is significant at *p*= 0.05 level

This model indicates that in order to motivate risk avoidance behavior, it is important to stress the personal relevance of a risk as well as enhance the actual knowledge and the feelings of self-efficacy. In order to enhance information seeking behavior it is necessary to stress the personal relevance as well. Furthermore, individuals need to have the expectation that avoiding particular food will have a positive impact on the health of an individual. In the case of dioxin, parents also need to be made aware of the long-term consequences dioxin can have

for their children in order to secure that these children do not suffer from illnesses related to dioxin later in life.

A point that draws attention is the fact that variables related to risk perception such as fear, severity and susceptibility were not significantly different for the different ages of children and also not found to be significantly predicting risk avoidance behavior. This has been contrary to expectation. In previous research, there has always been found a strong relation between risk perception and risk avoidance behavior (e.g. Stringer et al., 2001; Carvalho et al., 2008). However, in the study at hand variables related to risk perception have not been found to significantly predict risk avoidance behavior when adding other variables such as attitude towards changing eating behavior to the model. However, it can be assumed that the attitudes are partly formed through risk perception.

As pointed out above, the study aimed at answering two research questions. The second research question has been *"Does the existence of children or the age of these children influence mothers' behavior in cases of dioxin findings in food?"*.Thereby, two different hypotheses have been stated. Both included several sub hypotheses. The first hypothesis has been that there is a difference in risk avoidance behavior and information seeking behavior with regard to the three different groups. This hypothesis has only been partly confirmed by the data of this study. With regard to information seeking behavior, the data supported the hypothesis. Thus, women with children younger than 16 years of age reported higher levels of information seeking behavior than the two other groups.

However, with regard to risk avoidance behavior, the data did not support the hypothesis. Women without children reported the lowest level of risk avoidance behavior, however, there could not be find a significant difference between women with children under the age of 16 and women with children older than 16. The mean scores did differ indicating that women with smaller children reported slightly higher levels of risk avoidance behavior; however, this difference was not found to be significant. However, when taking into account the correlation coefficient between the age of the children and risk avoidance behavior, a significant negative correlation was found. That indicated that the older the children, the lower the levels of risk avoidance behavior. This finding indicates that the group division was probably not useful. The group of women with children older than 16 years also included women who had children who were much older than 16 years. This could have lead to the insignificant of the results. For future research, I would recommend to divide between women with children between 0 and 9 years old and women with children between 10 and 18 years

old in order to gain more insight in the relation between risk avoidance behavior and age of children.

Secondly, it has been expected that the three groups differ significantly on the independent variables. Again, this hypothesis could only be partly supported by the data. A significant difference could be found between women with children and women without children, independently of the age of the children. This indicates that parenthood in general influences perceptions and behavior in cases of a dioxin finding in food. The only variables that showed a significant difference between women with children under the age of 16 and women with older children were management, safety, expectation, relevance and attitude towards changing eating behavior. This indicates that women with smaller children have been less satisfied with the way the authorities dealt with the situation and that they have more concerns about the safety of food in Germany. Furthermore, women with small children have higher expectations with regard to their increased health when avoiding eggs and pork meat, they regard the dioxin problem as more relevant for themselves, and they have more positive attitudes about the avoidance of eggs and pork meat.

From the findings of the data analysis, the second research question "Does the existence of children or the age of these children influence mothers' behavior in case of a dioxin scandal?" can be answered as follows: Having children certainly influences risk avoidance behavior and information seeking behavior. However, contrary to expectation, the age of the children does not significantly influence risk avoidance behavior. In case of a dioxin scandal, it is of utmost importance that young children do not absorb much of the toxic substance, as they face a special risk. Therefore, mothers ought to be especially careful when having small children. The fact that women with small children actually engaged in more risk information seeking, but did not engage in more risk avoidance behavior is striking. It shows that the information available does not show the real risk young children face in relation to dioxin. Another explanation could be that mothers of young children do not consider information about risks as credible.

However, when interpreting the results of the study it has to be kept in mind that the study faced several limitations. When the research was initiated, the dioxin scandal was intensively covered in the news. Therefore, in the survey questions asking for behavior during the actual food scandal have been included. However, when the survey has been finally distributed, the dioxin scandal already passed into oblivion. In order to get reliable results of behavior, four questions which were concerned with expected future behavior have been included in the survey as well. It has been assumed that asking about the future will motivate

people to imagine themselves in such a situation and lead to a reliable approximation of actual behavior. However, it is still not possible to be completely sure that the answers given by the respondents were trustworthy estimates of their actual behavior. Another possibility could have been that people wanted to give socially desirable answers. Therefore, future studies need to include more reliable ways to measure risk avoidance behavior.

Second, the internal consistency of the scale is higher than normally expected. That indicates that the items were either too similar to be differentiated by the respondents or that respondents did not read all the items properly. The survey has been considerably long, repeating highly similar questions several times. Thereby, the different statements have only been slightly changed. Therefore, it could be the case that respondents did not read the statements carefully the whole time, but were just indicating similar levels of agreement for the statements under the same heading. Future research should improve the survey in order to make sure that the shortcomings of the method used do not influence the results.

Third, the survey items were developed by myself and not yet tested for their usefulness. Therefore, it is possible that the items are not meaningful enough, or they probably measure something slightly different from what that were assumed to measure.

In conclusion, the results of this study showed three aspects which are contrary to former studies or have been neglected. First, the variable relevance has significantly predicted information seeking behavior and attitude towards changing eating behavior. This variable has been neglected in recent literature. However, future research should clarify the exact role of relevance in risk avoidance and information seeking behavior in order to better understand the decision process of people at risk. Furthermore, the study showed that parenthood does influence risk avoidance and information seeking behavior. However, it would be interesting to see whether this is also true for men. Third, variables related to risk perception were not found to be significantly predicting risk avoidance behavior or attitude towards changing eating behavior. This is contrary to common scholarly wisdom. However, it seem that relevance shares a considerable amount of variance with risk perception, causing risk perception to be insignificant.

Efficient risk information becomes more and more important. During the writing process of this thesis, another food epidemic took place in Germany. In May 2011, the EHEC epidemic took place in Germany, resulting in several fatalities of both children and adults. This shows again that there is need to make individuals more aware of possible consequences of contaminated food. Future research is needed to test whether the model as proposed in this

study is able to explain risk avoidance and information seeking behavior in other instances as well.

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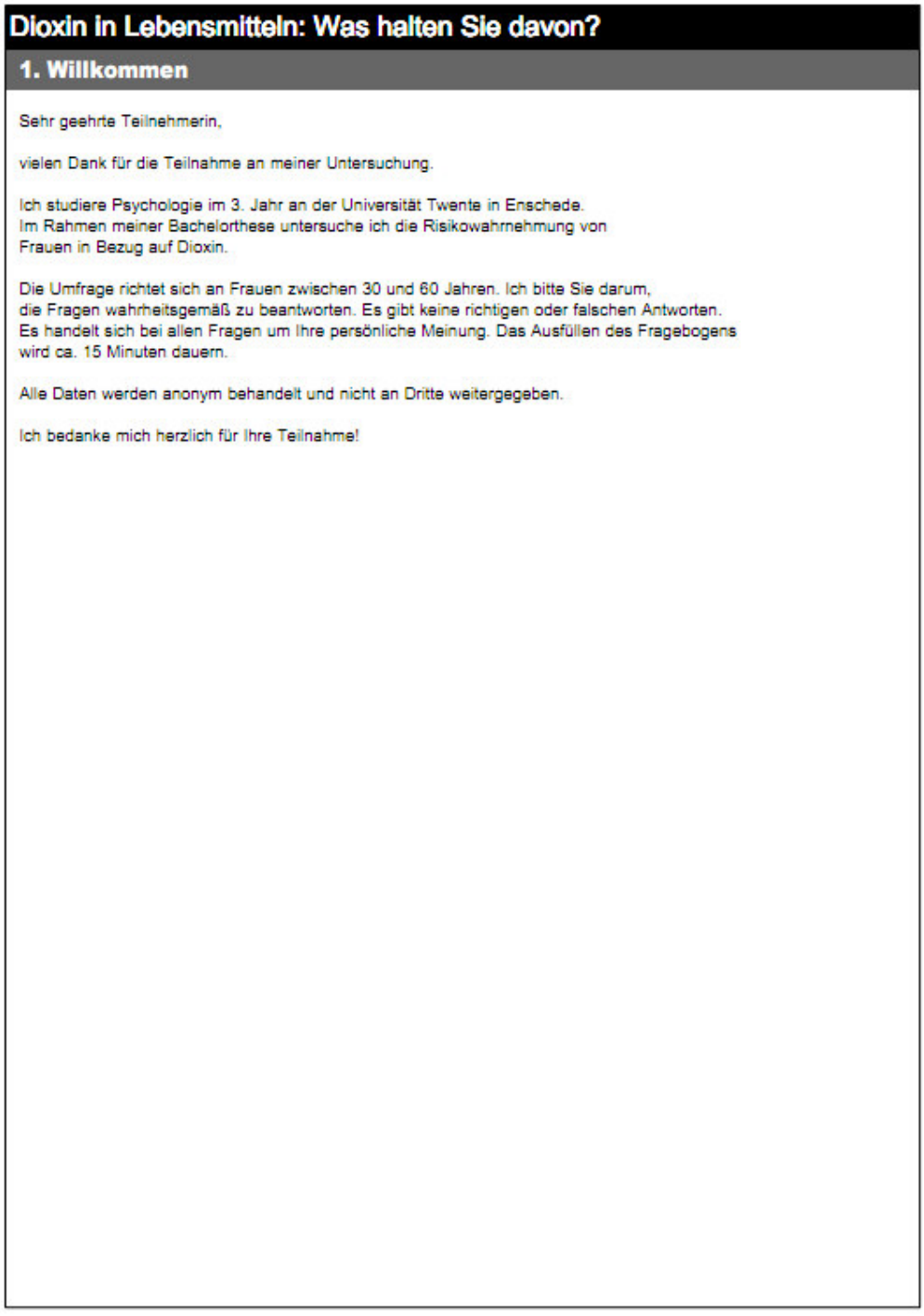
Appendix

Survey



Dioxin in Lebensmitteln: Was halten Sie davon?

1. Willkommen

Sehr geehrte Teilnehmerin,

vielen Dank für die Teilnahme an meiner Untersuchung.

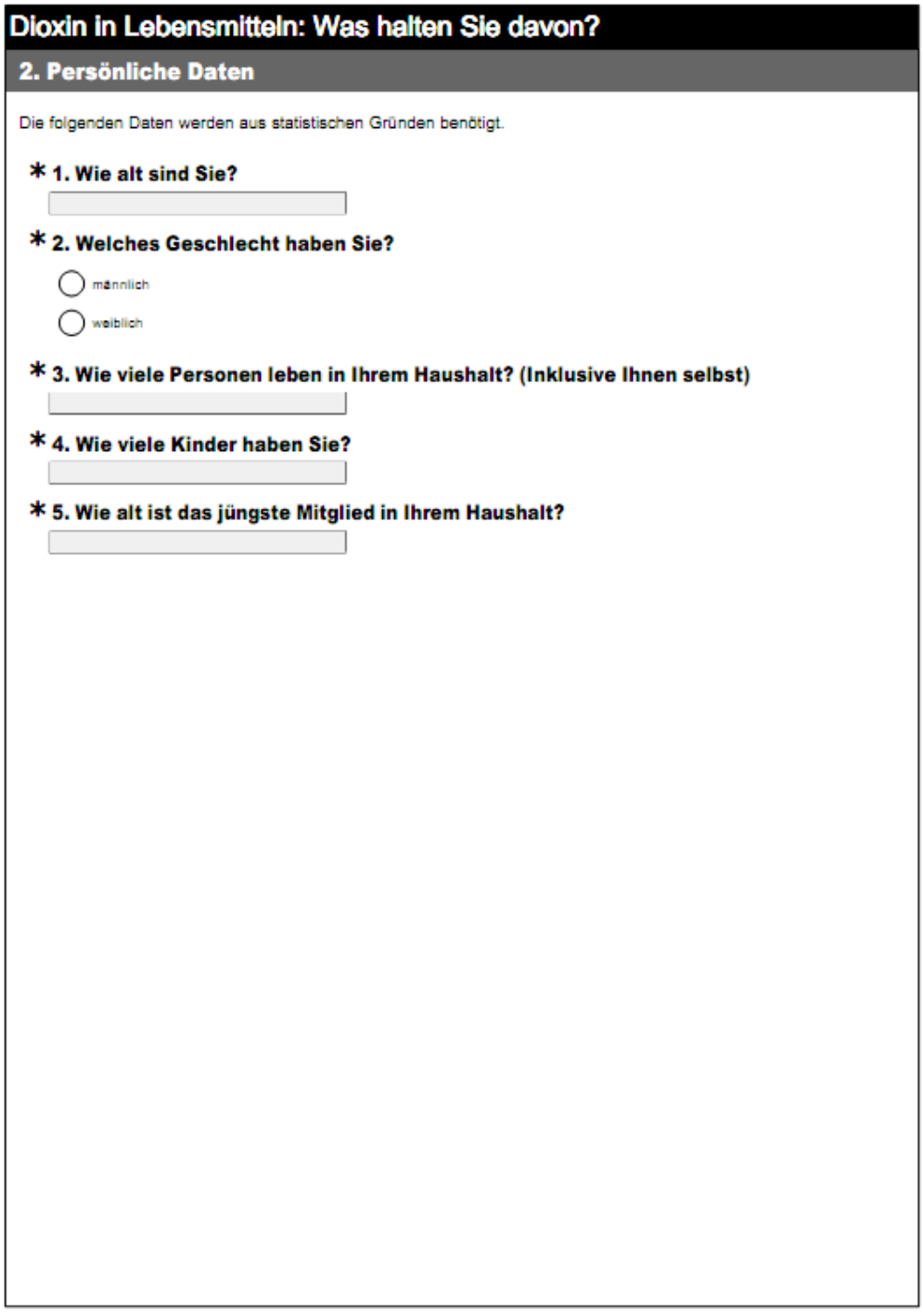
Ich studiere Psychologie im 3. Jahr an der Universität Twente in Enschede.
Im Rahmen meiner Bachelorthese untersuche ich die Risikowahrnehmung von
Frauen in Bezug auf Dioxin.

Die Umfrage richtet sich an Frauen zwischen 30 und 60 Jahren. Ich bitte Sie darum,
die Fragen wahrheitsgemäß zu beantworten. Es gibt keine richtigen oder falschen Antworten.
Es handelt sich bei allen Fragen um Ihre persönliche Meinung. Das Ausfüllen des Fragebogens
wird ca. 15 Minuten dauern.

Alle Daten werden anonym behandelt und nicht an Dritte weitergegeben.

Ich bedanke mich herzlich für Ihre Teilnahme!

Page 1



Dioxin in Lebensmitteln: Was halten Sie davon?

2. Persönliche Daten

Die folgenden Daten werden aus statistischen Gründen benötigt.

* **1. Wie alt sind Sie?**

* **2. Welches Geschlecht haben Sie?**

- ○ männlich
- ○ weiblich

* **3. Wie viele Personen leben in Ihrem Haushalt? (Inklusive Ihnen selbst)**

* **4. Wie viele Kinder haben Sie?**

* **5. Wie alt ist das jüngste Mitglied in Ihrem Haushalt?**

Page 2

Dioxin in Lebensmitteln: Was halten Sie davon?

3. Persönliche Daten

Die folgenden Fragen beziehen sich auf Ihre Essgewohnheiten.

* **1. Wer ist in Ihrem Haushalt hauptsächlich für den Einkauf zuständig?**

* **2. Wer ist in Ihrem Haushalt im Allgemeinen für die Zubereitung von Essen zuständig?**

* **3. Wie viele Tage pro Woche sind Sie durchschnittlich für die Zubereitung der warmen Mahlzeit zuständig?**

- ◯ 1
- ◯ 2
- ◯ 3
- ◯ 4
- ◯ 5
- ◯ 6
- ◯ 7

* **4. Haben Sie besondere Essgewohnheiten (z.B. Vegetarier etc.)?**

- ◯ Ja
- ◯ Nein

5. Wenn ja, welche besonderen Essgewohnheiten haben Sie?

* **6. Wie viele Eier werden in Ihrem Haushalt im Durchschnitt pro Woche gegessen?**

* **7. Wie oft essen Sie durchschnittlich Fleisch pro Woche (während einer Hauptmahlzeit)?**

Dioxin in Lebensmitteln: Was halten Sie davon?

4. Wissen

Nun beginnt die eigentliche Umfrage. Zuerst kommen einige Fragen zu Ihrem Wissen über Dioxin.

*** 1. Entscheiden Sie, ob die folgenden Aussagen richtig oder falsch sind.**

	Richtig	Falsch
Dioxin lagert sich im Fettgewebe des Körpers an.	◯	◯
Dioxin kann das Immunsystem beeinträchtigen.	◯	◯
Neugeborene haben das höchste Risiko durch die Aufnahme von Dioxin Schaden zu erleiden.	◯	◯
Dioxin wird unter anderem durch Vulkanausbrüche freigesetzt.	◯	◯

*** 2. In wie weit treffen die folgenden Aussagen auf Sie zu?**

	Trifft nicht zu	Trifft eher nicht zu	Weder noch	Trifft eher zu	Trifft zu
Ich weiß, welche Lebensmittel besonders gefährlich im Bezug auf Dioxin sind.	◯	◯	◯	◯	◯
Ich kenne die möglichen Folgen von einer zu hohen Dioxinaufnahme.	◯	◯	◯	◯	◯
Ich weiß, welche Personengruppen besonders anfällig für Dioxin sind.	◯	◯	◯	◯	◯
Ich weiß, was Dioxin in meinem Körper bewirken kann.	◯	◯	◯	◯	◯

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Dioxin in Lebensmitteln: Was halten Sie davon?

5. Informationen

Die folgenden Fragen beziehen sich auf die Informationen, die Sie über Dioxin haben.

*** 1. Bitte geben Sie an, in wie weit die folgenden Aussagen auf Sie persönlich zutreffen.**

	Trifft nicht zu	Trifft eher nicht zu	Weder noch	Trifft eher zu	Trifft zu
Ich habe ausreichend Wissen über Dioxin.	◯	◯	◯	◯	◯
Ich habe ausreichend Wissen über die möglichen Folgen von der Aufnahme von Dioxin.	◯	◯	◯	◯	◯
Ich habe genügend Informationen über Dioxin.	◯	◯	◯	◯	◯
Ich besitze genügend Informationen über die Wirkungsweise von Dioxin.	◯	◯	◯	◯	◯

*** 2. Bitte geben Sie jeweils an, in wie weit die folgenden Aussagen auf Sie persönlich zutreffen.**

	Trifft nicht zu	Trifft eher nicht zu	Weder noch	Trifft eher zu	Trifft zu
Ich habe Zeitungsartikel über den Dioxin-Skandal gelesen.	◯	◯	◯	◯	◯
Ich habe zusätzliche Informationen über Dioxin gesucht (z.B. im Internet).	◯	◯	◯	◯	◯
Ich habe Berichte über den Dioxin-Skandal im Fernsehen gesehen.	◯	◯	◯	◯	◯
Ich habe die Berichte über den Dioxin-Skandal nur überflogen.	◯	◯	◯	◯	◯
Ich habe die Berichte über Dioxin mit Interesse gelesen.	◯	◯	◯	◯	◯
Ich habe Zeit investiert um herauszufinden wie hoch das Risiko von Dioxin wirklich ist.	◯	◯	◯	◯	◯

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6. Management des Dioxin-Problems

Dieser Teil der Umfrage beschäftigt sich mit dem Handeln der Regierung, der Lebensmittelhersteller und der Futtermittelhersteller während des Dioxin-Problems.

*** 1. In wie weit stimmen Sie mit den folgenden Aussagen überein?**

	Stimmt nicht	Stimmt eher nicht	Weder noch	Stimmt eher	Stimmt
Die deutsche Regierung hat angemessen auf das Dioxin-Problem reagiert.	○	○	○	○	○
Die deutschen Lebensmittelvertriebe haben angemessen auf das Dioxin-Problem reagiert.	○	○	○	○	○
Die deutschen Tierfuttermittelhersteller haben angemessen auf das Dioxin-Problem reagiert.	○	○	○	○	○

*** 2. In wie weit stimmen Sie mit den folgenden Aussagen überein?**

	Stimmt nicht	Stimmt eher nicht	Weder noch	Stimmt eher	Stimmt
Die Informationen der Regierung bezüglich Dioxin sind vertrauenswürdig.	○	○	○	○	○
Die Informationen der Tierfuttermittelhersteller bezüglich Dioxin sind vertrauenswürdig.	○	○	○	○	○
Die Informationen der Lebensmittelhersteller bezüglich Dioxin sind vertrauenswürdig.	○	○	○	○	○

*** 3. In wie weit stimmen Sie mit den folgenden Aussagen überein?**

	Stimmt nicht	Stimmt eher nicht	Weder noch	Stimmt eher	Stimmt
Produkte in deutschen Supermärkten können ohne Bedenken konsumiert werden.	○	○	○	○	○
Lebensmittel in Deutschland sind sicher.	○	○	○	○	○
In Deutschland können Lebensmittel ohne Bedenken konsumiert werden.	○	○	○	○	○

*** 4. In wie weit stimmen Sie mit den folgenden Aussagen überein?**

	Stimmt nicht	Stimmt eher nicht	Weder noch	Stimmt eher	Stimmt
Die Lebensmittelhersteller haben ausreichend Fachwissen um das Risiko bezüglich Dioxin richtig einschätzen zu können.	○	○	○	○	○
Die Tierfuttermittelhersteller haben ausreichend Fachwissen um das Risiko bezüglich Dioxin richtig einschätzen zu können.	○	○	○	○	○
Die Regierung hat ausreichend Fachwissen um das Risiko bezüglich Dioxin richtig einschätzen zu können.	○	○	○	○	○

*** 5. In wie weit stimmen Sie mit den folgenden Aussagen überein?**

	Stimmt nicht	Stimmt eher nicht	Weder noch	Stimmt eher	Stimmt
Meiner Meinung nach sollten Futtermittelhersteller besser kontrolliert werden.	○	○	○	○	○
Ich bin der Meinung, dass die betroffenen Futtermittelhersteller hart bestraft werden sollten.	○	○	○	○	○
Ich finde, dass die Regierung die Vorschriften für die Lebensmittelherstellung verschärfen sollte.	○	○	○	○	○

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7. Copingstrategie

Die folgenden Fragen beziehen sich auf Ihre persönlichen Möglichkeiten mit Dioxin umzugehen.

*** 1. In wie weit stimmen Sie den folgenden Aussagen zu?**

	Stimmt nicht	Stimmt eher nicht	Weder noch	Stimmt eher	Stimmt
Ich kann mich vor den Folgen von Dioxin schützen.	◯	◯	◯	◯	◯
Auf Eier zu verzichten wirkt sich positiv auf meine Gesundheit aus.	◯	◯	◯	◯	◯
Ich habe die Möglichkeit Gesundheitsschäden durch Dioxin zu verhindern.	◯	◯	◯	◯	◯
Auf Schweinefleisch zu verzichten wirkt sich positiv auf meine Gesundheit aus.	◯	◯	◯	◯	◯
Ich habe die Möglichkeit die möglichen negativen Folgen von einer zu hohen Dioxinaufnahme zu verhindern.	◯	◯	◯	◯	◯
Ich kann auf den Verzehr von Eiern für eine kurze Zeit verzichten.	◯	◯	◯	◯	◯
Ich kann auf den Verzehr von Eiern für eine unbestimmte Zeit verzichten.	◯	◯	◯	◯	◯
Wenn ich auf Schweinefleisch verzichte sammelt sich weniger Dioxin in meinem Körper an.	◯	◯	◯	◯	◯
Wenn ich auf Eier verzichte sammelt sich weniger Dioxin in meinem Körper an.	◯	◯	◯	◯	◯

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8. Relevanz

Diese Seite beschäftigt sich mit der Relevanz, die Dioxin für Sie persönlich hat.

*** 1. In wie weit stimmen Sie mit den folgenden Aussagen überein?**

	Stimmt nicht	Stimmt eher nicht	Weder noch	Stimmt eher	Stimmt
Die möglichen negativen Konsequenzen von Dioxin sind für mich ein Problem, weil ich regelmäßig Eier esse.	◯	◯	◯	◯	◯
Mich persönlich betreffen die Gefahren durch Dioxin.	◯	◯	◯	◯	◯
Dioxin ist für mich persönlich ein Problem.	◯	◯	◯	◯	◯
Für mich persönlich ist Dioxin ein relevantes Problem.	◯	◯	◯	◯	◯

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9. Risikowahrnehmung

Dieser Teil der Umfrage beschäftigt sich mit der Risikowahrnehmung von Dioxin.

*** 1. In wie weit stimmen Sie mit den folgenden Aussagen überein?**

	Stimmt nicht	Stimmt eher nicht	Weder noch	Stimmt eher	Stimmt
Ich habe Angst vor möglichen langfristigen Gesundheitsschäden durch den Verzehr von dioxinhaltigen Lebensmitteln.	◯	◯	◯	◯	◯
Ich habe Angst vor möglichen Gesundheitsschäden durch den Verzehr von dioxinhaltigen Lebensmitteln.	◯	◯	◯	◯	◯
Ich habe Angst, dass ich krank werde, wenn ich zu viel Dioxin zu mir nehme.	◯	◯	◯	◯	◯
Ich habe Angst vor möglichen kurzfristigen Gesundheitsschäden durch den Verzehr von dioxinhaltigen Lebensmitteln.	◯	◯	◯	◯	◯
Ich fürchte mich davor durch Dioxin krank zu werden.	◯	◯	◯	◯	◯
Ich habe Angst vor Dioxin in Lebensmitteln.	◯	◯	◯	◯	◯

*** 2. Geben Sie jeweils an, in wie weit Sie mit den Aussagen übereinstimmen.**

	Stimmt nicht	Stimmt eher nicht	Weder noch	Stimmt eher	Stimmt
Ich kann durch den Verzehr von dioxinhaltigen Lebensmitteln gesundheitliche Schäden davontragen.	◯	◯	◯	◯	◯
Wenn ich Dioxin über die Nahrung aufnehme, kann das schwerwiegende Konsequenzen für mich haben.	◯	◯	◯	◯	◯
Die Konsequenzen einer Dioxinvergiftung sind schwerwiegend.	◯	◯	◯	◯	◯
Der Verzehr von dioxinhaltigen Nahrungsmitteln kann schwerwiegende gesundheitliche Folgen haben.	◯	◯	◯	◯	◯
Die Folgen vom Verzehr dioxinhaltiger Lebensmittel sind ernst zu nehmen.	◯	◯	◯	◯	◯
Eine Dioxinvergiftung hätte schwerwiegende Folgen für mich.	◯	◯	◯	◯	◯
Lebensmittel die Dioxin enthalten sind ein ernsthaftes Risiko für meine Gesundheit.	◯	◯	◯	◯	◯
Lebensmittel die Dioxin enthalten sind ein ernsthaftes Risiko für die Gesundheit.	◯	◯	◯	◯	◯

*** 3. In wie weit stimmen Sie mit den folgenden Aussagen überein?**

	Stimmt nicht	Stimmt eher nicht	Weder noch	Stimmt eher	Stimmt
Es ist wahrscheinlich, dass ich krank werde, wenn ich Lebensmittel mit hohen Dioxingehalt esse.	◯	◯	◯	◯	◯
Wenn ich regelmäßig Lebensmittel mit einem zu hohen Dioxingehalt verzehre, werde ich davon sicherlich krank.	◯	◯	◯	◯	◯
Es besteht die Gefahr, dass ich krank werde, wenn ich dioxinverseuchte Lebensmittel esse.	◯	◯	◯	◯	◯
Ich bin empfindlich für Krankheiten die in Verbindung mit Dioxin stehen.	◯	◯	◯	◯	◯
Ich bin anfällig für Krankheiten die in Verbindung mit der Dioxin-Aufnahme stehen.	◯	◯	◯	◯	◯

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10. Reue

Die folgenden Fragen beziehen sich auf mögliche Reue-Gefühle.

*** 1. In wie weit stimmen Sie mit den folgenden Aussagen überein?**

	Stimmt nicht	Stimmt eher nicht	Weder noch	Stimmt eher	Stimmt
Ich würde es bereuen, wenn ich weiterhin Eier esse und in der Zukunft durch Dioxin krank werden würde.	◯	◯	◯	◯	◯
Ich würde es bereuen nahe stehende Personen nicht von dem Konsum dioxinhaltiger Lebensmitteln abgehalten zu haben, wenn diese davon krank werden würden.	◯	◯	◯	◯	◯
Ich würde es bereuen, wenn ich Essen für meine Familie/Freunde kochen würde und einer von ihnen davon krank werden würde.	◯	◯	◯	◯	◯
Ich würde es bereuen, wenn ich weiterhin einhaltige Lebensmittel verzehre und davon krank werden würde.	◯	◯	◯	◯	◯

Dioxin in Lebensmitteln: Was halten Sie davon?

11. Standpunkt

Diese Seite beinhaltet einige Fragen zu Ihrer Einstellung gegenüber Dioxin und Ihrem Essverhalten.

*** 1. Geben Sie jeweils an, in wie weit Sie mit den folgenden Aussagen übereinstimmen.**

	Stimmt nicht	Stimmt eher nicht	Weder noch	Stimmt eher	Stimmt
Ich würde gerne weniger Schweinefleisch essen.	◯	◯	◯	◯	◯
Wenn meine Familie/Freunde auf Schweinefleisch verzichten würde, dann wären sie gesünder.	◯	◯	◯	◯	◯
Wenn meine Familie/Freunde auf Eier verzichten würde, dann hätte ich weniger Angst.	◯	◯	◯	◯	◯
Wenn meine Familie/Freunde auf Eier verzichten würde, dann wären sie gesünder.	◯	◯	◯	◯	◯
Ich würde gerne weniger Eier essen.	◯	◯	◯	◯	◯
Wenn ich auf Eier verzichten würde, dann wäre ich gesünder.	◯	◯	◯	◯	◯
Wenn meine Familie/Freunde auf Eier verzichten würde, dann wäre ich weniger besorgt.	◯	◯	◯	◯	◯
Ich finde es sinnvoll weniger Eier zu essen.	◯	◯	◯	◯	◯
Wenn ich auf Eier verzichten würde, dann hätte ich weniger Angst.	◯	◯	◯	◯	◯
Wenn ich auf Schweinefleisch verzichten würde, dann hätte ich weniger Angst.	◯	◯	◯	◯	◯
Wenn meine Familie/Freunde auf Schweinefleisch verzichten würde, dann hätte ich weniger Angst.	◯	◯	◯	◯	◯
Ich finde es sinnvoll weniger Schweinefleisch zu essen.	◯	◯	◯	◯	◯
Wenn ich auf Schweinefleisch verzichten würde, dann wäre ich gesünder.	◯	◯	◯	◯	◯

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12. Verhalten

Die letzten Fragen beziehen sich auf Ihr Verhalten in Bezug auf das Dioxin-Problem.

*** 1. In wie weit stimmen Sie mit den folgenden Aussagen überein?**

	Stimmt nicht	Stimmt eher nicht	Weder noch	Stimmt eher	Stimmt
Ich habe meinen Konsum von Schweinefleisch während des Dioxin-Skandals im Januar 2011 eingeschränkt.	◯	◯	◯	◯	◯
Ich habe meinen Konsum von Eiern während des Dioxin-Skandals im Januar 2011 eingeschränkt.	◯	◯	◯	◯	◯
Ich würde bei einem erneuten Dioxin-Skandal auf den Verzehr von Schweinefleisch verzichten.	◯	◯	◯	◯	◯
Ich würde bei einem erneuten Dioxin-Skandal auf den Verzehr von Fleisch verzichten.	◯	◯	◯	◯	◯
Mein Haushalt hat auf den Verzehr von Schweinefleisch während des Dioxin-Skandals im Januar 2011 verzichtet.	◯	◯	◯	◯	◯
Ich habe auf den Verzehr von Eiern während des Dioxin-Skandals im Januar 2011 verzichtet.	◯	◯	◯	◯	◯
Mein Haushalt hat seinen Konsum von Eiern während des Dioxin-Skandals im Januar 2011 eingeschränkt.	◯	◯	◯	◯	◯
Mein Haushalt hat auf den Verzehr von Eiern während des Dioxin-Skandals im Januar 2011 verzichtet.	◯	◯	◯	◯	◯
Ich habe auf den Verzehr von Schweinefleisch während des Dioxin-Skandals im Januar 2011 verzichtet.	◯	◯	◯	◯	◯
Mein Haushalt hat seinen Konsum von Schweinefleisch während des Dioxin-Skandals im Januar 2011 eingeschränkt.	◯	◯	◯	◯	◯
Ich würde bei einem erneuten Dioxin-Skandals auf den Verzehr von Eiern verzichten.	◯	◯	◯	◯	◯

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13. Fragen für Frauen mit Kindern unter 16

Die folgenden Fragen richten sich ausschließlich an Frauen, die Kinder in Ihrem Haushalt leben haben, die jünger als 16 sind.

1. In wie weit stimmen die folgenden Aussagen zu?

	Stimmt nicht	Stimmt eher nicht	Weder noch	Stimmt eher	Stimmt
Mein Kind/Kinder haben während des Dioxin-Skandals Eier gegessen.	◯	◯	◯	◯	◯
Mein Kind/Kinder haben den Eierkonsum eingeschränkt während des Dioxin-Skandals.	◯	◯	◯	◯	◯
Mein Kind/Kinder haben während des Dioxin-Skandals Schweinefleisch gegessen.	◯	◯	◯	◯	◯
Mein Kind/Kinder haben den Schweinefleischkonsum eingeschränkt während des Dioxin-Skandals.	◯	◯	◯	◯	◯

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14. Abschluss der Umfrage

Sie haben das Ende der Umfrage erreicht.
Vielen Dank für Ihre Teilnahme.

Sollten Sie Interesse an den Ergebnissen meiner Untersuchung haben, dann schicken Sie bitte eine Nachricht an die folgende Emailadresse: m.s.bentfeld@student.utwente.nl
Ich werde Ihnen dann im Juni eine Zusammenfassung der Ergebnisse zukommen lassen.

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