The Effect of Familiarity and Dread on Health Risk Perception

Martina Steul-Fischer, University of Erlangen-Nuremberg, Germany
Silvia Heideker, University of Erlangen-Nuremberg, Germany

Health risk perception is elementary for explaining health behavior. Familiarity and dread are important factors for explaining perceived risk. We experimentally analyze health threat in terms of dread and familiarity on health risk perception. Our results show that unfamiliarity increases health risk perception with dread as mediator.

[to cite]:

[url]:
http://www.acrwebsite.org/volumes/1018828/volumes/ap11/AP-11

[copyright notice]:
This work is copyrighted by The Association for Consumer Research. For permission to copy or use this work in whole or in part, please contact the Copyright Clearance Center at http://www.copyright.com/.
The Effect of Familiarity and Dread on Health Risk Perception
Silvia Heideker, University of Erlangen-Nürnberg, Germany
Martina Steul-Fischer, University of Erlangen-Nürnberg, Germany

ABSTRACT
Although people know that smoking can cause lung cancer and see health advertisements against smoking, they still light up cigarettes. In this case, consumers are seemingly not threatened enough by the health risk to avoid risky behavior such as smoking. One reason could be the biased perception of health risks as a basis for all health-related behavior. However, which factors influence health risk perception and contribute to the specific perceived level of risk? How can health risk perception be described and potentially manipulated? Does greater threat cause higher health risk perception and therefore increase the possibility of changing behavior? Moreover, if so, can factors such as familiarity and dread of a health danger contribute to higher threat? Answers to these questions are not only relevant for companies that want to sell health-related services or parts of the public sector, such as health insurance providers that want their insured consumers to behave in a more healthy manner in order to lower costs, for example; they are also a focus of risk perception research and, in particular, health risk perception research.

This paper uses the implications of the psychometric paradigm established by Slovic, Fischhoff and Liechstenstein (1980), a dominant paradigm relating to risk perception, and the paradigm’s factors ‘dread’ and ‘familiarity’ to predict specific health risk perception. In this respect, the following paper examines the effects of these factors on each other and on the level of health risk perception. In addition to new insight into health risks, the results provide new information about health risk perception by giving suggestions for adapted methods to measure the factors dread and familiarity, by proving that dread mediates familiarity in the case of health risks, and by using these factors to predict the level of health risk perception. With this knowledge, public sector organizations, such as health insurance providers, will be able to design preventive health advertising more effectively in order to increase health risk perception and consequently to increase the public’s intentions of changing health behavior by framing their information with higher or lower familiarity and dread.

CONCEPTUAL FRAMEWORK
Health risk perception
Health risk perception is often included in specific models of health behavior, although the significance accorded to its influence varies. The comprehension of health risk perception is based on these models and theories, and it makes sense to take a closer look at health behavior models. Knowing that there is currently no model that can explain health behavior, and subsequently health risk perception, perfectly, there is a need for new approaches to health risk perception.

In general, Conner and Norman (2005) define health behavior as any activity undertaken for the purpose of preventing or detecting disease or for improving health or well-being. The model which accords major importance to health risk perception and greatly influences researchers was developed in the late 1950s as the Health Belief Model (HBM) (Hochbaum 1958, Rosenstock 1960) and was subsequently improved by Becker (1974). The HBM uses the following constructs: Perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy and cues to action. Perceived threat depends on an individual’s perceived vulnerability to contracting a specific disease plus its perceived severity. These are influenced by cognitions as a result of socio-demographic and socio-psychological influences. In terms of criticism of the model, Clark and Janevic (2014, p. 13) mention that the HBM as a psychosocial model is limited to accounting for as much of the variance in individual’s health-related behaviors as can be explained by their beliefs and attitudes, and that other forces also influence health behavior. In addition, Carpenter (2010) mentions that the constructs of self-efficacy and cues to action have rarely been tested. Furthermore, LaBrosse and Albrecht (2013) reason that in their pilot study folate intervention based on the HBM effectively increased knowledge about folate and health, but had no effect on increasing consumption of folate-rich food and no significant effect on perceived benefits, barriers, severity or cues to action. Clark and Janevic (2014, p.13) criticize the premise of the HBM that health is a highly valued concern or goal for most individuals and cues to action are prevalent. If these conditions are not satisfied, the model is not able to predict behavior. In addition to the present criticism, situational and threatening aspects of health risks do not feature prominently in the HBM.

Other models that should be mentioned in matters of health behavior as a result of health risk perception include the Protection Motivation Theory (PMT) (Rogers 1975). In the PMT, the strength of completion perception results from self-efficacy and activity efficiency reduced by activity costs. The Theory of Planned Behavior (TPB) (Ajzen 1991) connects intention and behavior but does not provide an answer to how consumers can be motivated to practice healthier behavior. Prochaska and DiClemente (1982) developed the Transtheoretical Model (TTM), which implies that consumers pass through different stages called processes of change instead of a continuous change of behavior. Bandura’s Social Cognitive Theory (SCT) from 1977 forecasts health behavior through perceived self-efficacy and outcome expectations. Therefore, perceived self-efficacy includes perceived situational controllability.

Previous research has focused on health behavior in general, and health risk perception is just one factor in specific models. With regard to health risk perception, Menon, Rahgurib and Agrawal (2007, p. 985) classify common research into five major types of psychological factors: motivational, cognitive, affective, contextual, and individual differences. Affective factors influence consumers' ability to deal with negative information (Menon, Rahgurib and Agrawal, 2007, p. 987). If health risk information is seen as negative, it is necessary to take a closer look at affective parameters and threatening situational influences such as “familiarity” and “dread” of health risks because they may play a role in this context. Until now, situational and threatening influences of health risks on health risk perception have not yet been analyzed sufficiently in present research.

Health risk perception and psychometric approach
In contrast to general risk perception, Ajzen and Timko (1986) point out that specific health behavior is largely unrelated to general attitudes such as attitude towards medical services, concern about illness and evaluation of health practices. On the other hand, they also assume that attitudes and perceived control with respect to specific health-related actions correlate highly with corresponding behaviors. Obeying these thoughts, attitudes act as predictors in terms of predicting behavior. Furthermore, Menon, Rahgurib and Agrawal (2007, p. 982) underline the interplay of cognitive and affective systems in the construction of risk estimates and analyze the factors which moderate the link between health risk perceptions and health behavior.
It is important to differentiate between the cognitive, emotional and behavioral level. The cognitive level includes thoughts about specific risks and the emotional level includes positive or negative feelings that are triggered through an event or scenario. In response to this, it is important to distinguish between objective, given factors and subjective, perceived factors which for their part influence cognitive and emotional consumer attitude. The level of health risk perceived by consumers can be objectively less or more risky depending on the current health risk situation or can, due to perception, be subjectively more or less risky. To analyze the level of health risk perception, it is necessary to identify objective, given and subjective, perceived health risks which can be manipulated in order to measure their influence on health risk perception. However, there is no general overall view of health risk classes and an objective scale of health risks.

Our research distinguishes between external and internal health risks. External risks affect consumers’ health (for example technology, environment and accidents) but cannot be greatly influenced by the consumer themselves. In terms of internal risks, a distinction has to be made between the unalterable risks of genetics and risks that result from active and passive behavior. Many health risks cannot be categorized in simply one of these classes; for example, lung cancer could be caused by smoking cigarettes as active behavior, by technologies such as x-rays, by genetic predisposition, or simply by missing several preventive check-ups. Following these thoughts, a virus seems to be a suitable health risk for our study; it is possible to present an objectively risky or less risky situation and likewise a subjectively riskier or less risky perceived health risk to consumers.

To the best of our knowledge, there are no specific studies that have tried to use the threatening factors “dread” and “familiarity” from the psychometric paradigm to predict health risk perception. Risk perception research has been dominated by the psychometric paradigm established by Slovic, Fischhoff and Liechtenstein (1980). The psychometric paradigm is fairly successful in predicting and explaining perceived risk. Slovic, Fischhoff and Liechtenstein (1980) identified dread and familiarity as two describing components for risks. Familiarity and dread accounted for over 70% of the variance in risk perception. Further research confirmed these findings (Poumadere et al. 1995, Wiegman, Gutteling and Cadet 1995, Bronfman and Cifuentes 2003). Bronfman, Cifuentes and Gutiérrez (2008) suggest that the psychometric paradigm is also able to explain differences among participants, while socio-demographic conditions have no substantial explanatory power on their own. Only Mullet, Ciutad and Rivière-Shafighi (2004) examine the cognitive processes involved in lay people’s health risk assessment using factors of the psychometric paradigm. Likewise correlated to health risks, Flynn, Slovic and Mertz (1994) for their part investigated differences between men and women regarding health risks, and found that risk perception also varies depending on the type of risk in question. The aim of our study is to determine the explanatory power of the psychometric paradigm for health risks, including the possible influencing factors familiarity and dread.

Familiarity

In terms of general risk perception, several researchers have investigated familiarity; for example Weber, Siebenmorgen and Weber (2005), Richardson, Sorenson and Soderstrom (1987) and Zuckerman (1979) found that risk perception increases as familiarity increases. Related to research of health risks and familiarity, Royne et al. (2014) found a moderating effect of familiarity with direct-to-consumer advertising and the relationship between health consciousness and attitude toward dietary supplements. Their findings also suggest that knowledge plays an important role in attitude and perception formation. Furthermore, they point out that benefit and risk information about supplements should be provided to consumers so they can make informed decisions about their health. In addition, Mullet, Ciutad and Rivière-Shafighi (2004) verify that knowledge has an effect on the judged severity. Following these insights, knowledge and therefore familiarity as a part of the classic psychometric paradigm may influence health risk perception formation in a certain way. Consumers’ willingness to react to specific events depends on their attitude towards the risk. As attitudes act as predictors for health behavior, they also predict health risk perception as part of health behavior. Accordingly, familiarity affects health risk perception.

Dread

Like familiarity, the effect of dread on general risk perception was the focus of many investigations by Slovic, Fischhoff and Lichtenstein (1980, 1981 and 1984). In the original psychometric paradigm, dread includes aspects such as the risk is seen to be uncontrollable, catastrophic, hard to prevent, fatal, inequitable, threatening to future generations, not easily reduced, increasing, involuntary, and threatening to the person evaluating the risk. Mullet, Ciutad and Rivière-Shafighi (2004) found interactions between familiarity and dread in the context of health. In this context, dread and knowledge are combined in a subadditive way. Additionally, if the risk is not well known, the effect of dread is reduced. When knowledge is seen as a prior factor for familiarity, familiarity affects dread accordingly.

Hypothesis 1: The more unfamiliar a health risk is perceived to be, the more dread is perceived.

Because of its implicit danger to consumer health, it is logical to assume that dread affects health risk perception. Dread has an effect on judged severity; in the case of a higher level of dread, there is a higher judged severity (Mullet, Ciutad, Rivière-Shafighi 2004). Accordingly, dread affects health risk perception.

Hypothesis 2: The more dread is perceived, the higher the health risk perception.

In exactly the same way as in general risk perception, in health risk perception consumers have to be personally threatened by the health risk to change health behavior, as is seen in common health behavior models. For health risk perception, specific health risks must exist and be present for the consumer. If they are not familiar with a health risk, participants cannot evaluate the level of dread. Chronologically, familiarity comes before dread, and without any familiarity there is no possibility of discovering dread. Dread seems to mediate the relationship between familiarity and health risk perception. Accordingly, familiarity affects dread and results in higher perceived health risks.

Hypothesis 3: The more dread is perceived, the more familiarity affects health risk perception and health risk perception is higher. Dread mediates unfamiliarity.

STUDY

Our study tests the prediction that dread and familiarity will have an effect on health risk perception (H1, H2 and H3). The theory-based hypotheses include familiarity as an independent variable, dread as a mediator and health risk perception as a dependent variable. We assume that if a given health risk is objectively dreadful and unfamiliar then consumers’ subjective health risk perception is higher compared to a non-dreadful and familiar health risk.
Method

Two hundred and fifty-eight university students (34.5% male, age ranging from 17 to 30 years, mean age = 24.77 years) participated in this study. Participants were assigned at random to one of four conditions in a 2 (familiarity: familiar/unfamiliar) x 2 (dread: not dreadful/dreadful) between-subjects design. Participants were invited to read an article from a prestigious journal. In this article, participants read information about a virus called ZZP. By giving specific keywords for dread and familiarity respondents perceived their scenario to be not dreadful or dreadful and familiar or unfamiliar. Similarity from objective and subjective familiarity and dread were successfully tested through a manipulation check.

Participants’ perceived level of dread, familiarity and health risk was quantified after they read the scenarios based on existing scales from the psychometric paradigm. A pretest indicated that the items for the variables dread and familiarity needed to be modified to fewer items than in the original psychometric paradigm because of its transfer from general risk perception to health risk perception. Therefore, items for dread were reduced to eight compared to the original nine items, which was warranted as the original item “voluntary” is not needed in a study with a given virus that affects every participant. The new scale for familiarity used was the result of reducing five items to two items, focusing on the most influential factors of “awareness” and “knowledge”. Referring to Menon, Raghurib and Agrawal (2007, p. 1000), awareness is an important subject to analyze when consumers are faced with health hazards as in our study. Furthermore, Orom, Kiviniemi, Shavers, Ross and Underwood (2013) argue that health risk perception can be influenced by access to health messages and the presence of several health risks. As a result of the greater presence, we consider “knowledge” to have a major influence on health risk perception and to be worthy of examination.

Based on the original psychometric paradigm, for both constructs a 7-point scale was used (see Appendix A). To check the validity of these new measurement scales for both constructs, Cronbach’s Alpha was used as the most prominent and most frequent criteria which can be used for constructs with only two items or higher (Cronbach, 1951). In our study we calculated α =0.740 for familiarity and α=0.885 for dread respectively. To measure health risk perception we used one item on a 10-point scale from 1 (no risk for own health) to 10 (very high risk to own health). The questionnaire was completed with questions on “own health condition” with a 7-point scale (Lumpkin and Hunt 1989) (α=0.717), “risk aversion” with a 7-point scale (Donthu and Gilliland 1996) (α=0.759), and “knowledge” and “thoughts about health risks”, each with a 5-point scale.

Results and Discussion

Manipulation Check: ANOVA reveals significant perceived familiarity (M_familiar=4.57 and M_unfamiliar=5.73, p=.000) as well as perceived dread (M_not_dreadful=2.76 and M_dreadful=4.20, p=.000). Thus, participants’ objective and subjective perception is similar. Health risk perception is different between the scenarios familiar and unfamiliar (M_familiar=3.94 and M_unfamiliar=4.66, p=.029), as well as not dreadful and dreadful (M_not_dreadful=2.80 and M_dreadful=6.12, p=.000).

Results: Among all participants the scenario is perceived as realistic (M=3.71, SD=1.62), plausible (M=3.63, SD=1.41) and easy to understand (M=3.16, SD=1.44) (see Appendix A). Correlation analysis reveals a correlation between familiarity and dread (r=.20, p=.001) which should indicate mediation (Baron and Kenny, 1986, p. 1177). There is no significant correlation between familiarity and health risk perception (r=.09, p=.164). Furthermore, there is a correlation between dread and health risk perception (r=.77, p=.000).

Along together, hypotheses 1, 2 and 3 suggest an indirect effect, whereby the relationship between familiarity and health risk perception is transmitted by dread. To test this mediation, similarly to Cole, Walter and Bruch (2008), regression analysis was done with the SPSS macro PROCESS as described by Hayes, due to several defects in the multi-stage method described by Baron and Kenny (1986). This macro enables estimation of the indirect effect with the normal theory approach and with the bootstrapping approach to obtain confidence intervals, and also incorporates the stepwise procedure described by Baron and Kenny.

The results for hypotheses 1-3 are reported in table 1. Proving hypothesis 1, familiarity is positively associated with dread, as indicated by a significant unstandardized regression coefficient (B=0.14, t=3.26, p=.001).

This supports hypothesis 1, the more unfamiliar a health risk is perceived to be, the more dread is perceived. Consistent with this, Richardson, Sorenson and Soderstrom (1987) found decreasing perception of technology risks as familiarity increased. Testing hypothesis 2, a positive relationship between dread and health risk perception controlling for familiarity is shown (B=1.73, t=19.57, p=.000).

Therefore, hypothesis 2 is supported: the more dread is perceived, the higher the health risk perception. Seeing health behavior as an outcome of health risk perception, similar findings to our results

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct and total effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health risk perception regressed on familiarity:</td>
<td>0.14</td>
<td>0.10</td>
<td>1.40</td>
<td>.164</td>
</tr>
<tr>
<td>Dread regressed on familiarity:</td>
<td>0.14</td>
<td>0.04</td>
<td>3.26</td>
<td>.001</td>
</tr>
<tr>
<td>Health risk perception regressed on dread, controlling for familiarity:</td>
<td>1.73</td>
<td>0.09</td>
<td>19.57</td>
<td>.000</td>
</tr>
<tr>
<td>Health risk perception regressed on familiarity, controlling for dread:</td>
<td>- 0.11</td>
<td>0.06</td>
<td>- 1.75</td>
<td>.081</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Value</th>
<th>SE</th>
<th>z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sobel</td>
<td>0.25</td>
<td>0.08</td>
<td>3.21</td>
</tr>
<tr>
<td>M</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LL 95% CI</td>
<td>UL 95% CI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effect Bootstrap results for indirect effect</td>
<td>0.25</td>
<td>0.08</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Note: N = 258. B = Unstandardized regression coefficients. Bootstrap sample size = 5,000. LL = lower limit; CI = confidence interval; UL = upper limit.
were found by O’Connor and White (2010), where dread of risks was found to be a predictor of non-users’ willingness to engage in a free trial of functional foods. In our study, there is no significant direct effect for health risk perception as a dependent variable regressed on familiarity (B=0.14, t=1.40, p= .164) which backs the notion of dread as a mediator. Finally, testing hypothesis 3, familiarity is found to have an indirect positive effect on health risk perception (B=0.25). The formal two-tailed significance test assuming normal distribution demonstrates this indirect effect significantly (Sobel z=3.21, p= .001). Bootstrap results confirm the Sobel test, as is seen in the table of results, with a bootstraped 95% CI around the indirect effect not containing zero (0.10, 0.40). The model shows good explanatory power (R²= 0.60) for our global assumption of health risk perception as a dependent variable and familiarity as an independent variable. These results support hypothesis 3, the more dread is perceived, the more familiarity affects health risk perception and health risk perception is higher. Dread evidently mediates familiarity.

Other results are shown through an ANOVA: Having experience with a virus (M=4.21, SD=2.63) and having no experience with a virus (M=4.53, SD=2.53) has no significant influence on the level of perceived health risk. Considering the means of health risk perception supports hypothesis 3 that unfamiliarity in terms of having no experience with a virus increases health risk perception compared to having experienced the virus. An ANOVA shows that women (M_women=4.62, SD_women=2.62) perceive health risk as significantly higher than men (M_men=3.85, SD_men=2.46, p= .023). Several other studies also report significant differences by gender. Dosman, Adamowicz and Hrudey (2001) showed that women perceive risks from food as significantly higher for women (M_women=3.54, SD_women=1.22) compared to men (M_men=3.24, SD_men=1.08, p= .049), which is the same result obtained by Bronfman, Cifuentes and Gutiérrez (2008). Similarly to common research, the results show that women (M_women=2.98, SD_women=1.20) have significantly lower risk aversion than men (M_men=3.37, SD_men=1.17, p= .013). Underlining these findings, our results are not biased due to knowledge of health risks (M_women=2.61, SD_women=0.80 and M_men=2.45, SD_men=0.80, p= .128), thoughts about health risks (M_women=2.73, SD_women=0.93 and M_men=2.83, SD_men=0.88, p= .505), or perception of own health condition (M_women=3.37, SD_women=1.23 and M_men=3.17, SD_men=1.39, p= .257), because there are no significant differences between women and men.

GENERAL DISCUSSION

The aim of our study was to examine the psychometric paradigm originally proposed by Slovic, Fischhoff and Liechtenstein in the early 1980s to predict health risk perception. Our study supports the conclusion that the classical paradigm is able to explain differences in health risk perception even though the scales used to measure “dread” and “familiarity” have to be modified to fit health risks because of the differences between general risk perception and health risk perception. Our findings suggest that higher subjective familiarity and consequently higher subjective dread cause a higher subjective perceived level of health risk. This applies more notably for women than for men. Further research should examine particular personality traits in addition to the situation-based factors of dread and familiarity that might influence the level of health risk perception. As Ajzen and Timko (1986) mention, attitudes correlate highly with corresponding behaviors. It is not enough to simply intentionally threaten consumers through dread and unfamiliar risks to change their health behavior. Nevertheless, increasing health risk perception using the factors familiarity and dread is one significant option.

In line with this conclusion, it is important to underline that negative information generally comes to mind more easily than positive information (Higgins, 1989) and therefore may be more likely to influence risk perception. In connection with our study, health risks are manipulated by giving specific words as a kind of framing. Framing effects in health risk perception are therefore a distinct area in research with specific phenomena, such as that framing affects the efficacy of health messages (Block and Keller, 1995 or Keller, Lipkus and Rimer, 2003), and surely affect our results in a certain way. It is also important to mention that negative information like that given in our study could put people in a negative mood which may mean that consumers are less likely to process health messages, as Keller, Lipkus and Rimer (2003) show.

Our study has shown the effect of dread as a mediator for familiarity for the level of health risk perception. For companies such as health insurance providers that need a higher risk perception through health advertisement to increase healthier consumer behavior, this effect implicates a combination of higher dread and lower familiarity to increase health risk perception. The combination of this knowledge and framing effects remains a topic for further research.

Health risk perception is an essential factor in health behavior. Understanding health risk perception is one approach used to predict health behavior. However, following the classification of health risk perception research by Menon, Raghubir and Agrawal (2007, p. 985) into the five major types of psychological factors, motivational, cognitive, affective, contextual, and individual differences, it seems obvious that no complete model that explains health behavior perfectly can exist until the five layers, as well as their interaction and correlation, are examined completely. This should be considered by future investigations.

With dread and familiarity, we have examined two essential factors for health risk perception on the objective and subjective level of consumer perception, but some other intervening factors may exist. Personal traits and consumers’ personalities may also influence the results. At the personality level, for instance, controllability attenuates self-positivity as a bias on health risk perception, as Darvill and Johnson (1991) show. “Depressive realism” examined by Keller, Lipkus and Rimer (2002) shines another spotlight on the influence of personal traits on health risk perception, to name just one example.

Our study focuses on situational and threatening effects and should be linked with other factors influencing health risk perception. Furthermore, to what extent the results can be transferred to other health risks with higher or lower controllability through consumer behavior is a potential topic for further research.

REFERENCES


LaBrosse, Lindsay and Julie A. Albrecht (2013), “Pilot intervention with adolescents to increase knowledge and consumption on foralate-rich foods based on the Health Belief Model”, International Journal of Consumer Studies, 37 (May), 271-278.


APPENDIX: Measures and Validation

Health Risk Perception (10-point Scale)
Scenario is risky to your health (1 = “No risk” to 10 = “Very high risk”)

Dread: According to Slovic, Fischhoff and Liechtenstein (1980) (α =0.885)
1 = “Very high controllability” to 7 = “Very low controllability”
1 = “Not dreadful at all” to 7 = “Very dreadful”
1 = “Not global at all” to 7 = “Very global”
1 = “Not deadly at all” to 7 = “Very deadly”
1 = “Affects few” to 7 = “Affects many”
1 = “No risk for further generations” to 7 = “High risk for further generations”
1 = “Easy to reduce” to 7 = “Hard to reduce”
1 = “Decreasing risk” to 7 = “Increasing risk”

Familiarity: According to Slovic, Fischhoff and Liechtenstein (1980) (α =0.740)
1 = “Totally familiar to public” to 7 = “Not familiar at all to public”
1 = “Up-to-date knowledge of public” to 7 = “Not up-to-date at all knowledge of public”

Own health condition: According to Lumkin and Hunt (1989) (α =0.717)
Compared to others my age, I am healthier 1 = “Totally agree” to 7 = “Totally disagree”
Compared to others my age, I have no physical problems 1 = “Totally agree” to 7 = “Totally disagree”

Risk aversion: According to Donthu and Hunt (1996) (α =0.759)
I would rather be safe than sorry 1 = “Totally agree” to 7 = “Totally disagree”
I want to be sure before I purchase anything 1 = “Totally agree” to 7 = “Totally disagree”
I avoid risky decisions 1 = “Totally agree” to 7 = “Totally disagree”

Knowledge about health risks:
1 = “Very good” to 5 = “Very low”

Thoughts about health risks:
1 = “Very much” to 5 = “Little”

Realistic:
1 = “Very realistic” to 7 = “ Unrealistic”

Plausible:
1 = “Plausible” to 7 = “Not plausible”

Complex:
1 = “Easy” to 7 = “Very complex”