

Bachelor Thesis

The Influence of Ease of Retrieval on Judgemental Confidence and Risk-Information-Seeking  
and Processing

by

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1<sup>st</sup> of July 2020

### **Abstract**

An increasing number in global calamities, among others because of climate change, requires the population to seek and process risk-related information. Previous research has successfully identified several factors that influence risk information-seeking and processing, of which information sufficiency is one of the most important and direct ones. However, what has not been investigated yet is the role judgemental confidence plays in this context. Therefore, this study aimed at being the first to show the influence of judgemental confidence on the information-seeking and processing behaviour by manipulating judgemental confidence directly with an ease-of-retrieval manipulation. Building on existing theories and models, it asks: To what extent does the perceived ease or difficulty of retrieval affect the confidence in one's own knowledge and therefore the motivation to seek and process risk-related information? An online survey was conducted among a mostly German and Dutch convenience sample and participants were randomly assigned to either a difficult or easy retrieval condition, in which their judgemental confidence was intended to be either reduced or boosted before being asked climate change-related questions. The results did not indicate any significant difference in information-seeking and processing based on the ease of retrieval manipulation and therefore also the degree of judgemental confidence. However, limitations such as sampling problems as well as issues with the chosen risk of climate change inhibit the generalizability of these results. Further research is needed to further explore the role of judgemental confidence in risk information-seeking and processing.

## 1. Introduction

Weather-related, geophysical, and technological disasters such as floods, earthquakes, and industrial accidents have increased in frequency in Europe in the period between 1998 and 2009 immensely, causing more than eleven million people to be affected (European Environment Agency, 2011). An increasing number of calamities that affect more and more people requires the general population to look for information pertaining to these risks.

According to the Risk Information-Seeking and Processing (RISP) model by Griffin, Dunwoody, and Neuwirth (1997), seven factors determine the extent to which someone seeks out risk-related information. As one of the most direct determinants of information-seeking and processing behaviour, information sufficiency was identified. According to the RISP model, information sufficiency describes the confidence in the knowledge one has about the risk and the action that the risk requires. When the sufficiency threshold (the perceived amount of knowledge needed) is higher than the available knowledge, one is more motivated to seek information (Griffin, Dunwoody, & Neuwirth, 1997). Additionally, the motivation to look for information and actually make behavioural changes is fostered by high involvement, a high perceived risk, and high response efficacy (Kievik, ter Huurne, & Gutteling, 2012). Not only the RISP model but also the Framework of Risk Information-seeking (FRIS) highlights the importance of the individual's confidence in own abilities when it comes to seeking information (ter Huurne, 2008). A study that was part of this framework examined the influence of confidence by exploring the relationship between people who thought of themselves as being confident about their current risk-related knowledge and their information sufficiency. The results revealed that the confident participants showed the highest scores on information sufficiency and the lowest scores in affective responses (ter Huurne, 2008), indicating that the confident participants are more likely to feel that their need for information has been satisfied and show less negative affective responses like anxiety or worry.

What never has been done before is directly influencing someone's confidence to research its influence on information-seeking behaviour and therefore, it is also not clear, whether judgemental confidence actually plays an as important role as identified by the two presented models. While the direct link between judgemental confidence and information-seeking and processing could not be established yet, the domain of social psychology successfully established a relationship between the experienced ease of retrieval, which is the degree to which people feel ease when recalling content, and judgemental confidence. An

experimental study by Schwarz et al. (1991) showed that the degree to which people feel ease of retrieval has a major influence on the information that can be retrieved. For the current research, this means that people's confidence can be influenced by the ease with which risk-related information can be retrieved from memory. Therefore, the aim of this study was to be the first to show the influence of judgemental confidence on information-seeking and processing behaviour by manipulating judgemental confidence directly with the ease-of-retrieval manipulation. The resulting research question is "To what extent does the perceived ease or difficulty of retrieval affect the confidence in one's own knowledge and therefore the motivation to seek and process risk-related information?"

## 1.1 Theoretical Framework

**1.1.1 (Risk-) Information-seeking and Processing.** The Risk Information-seeking and Processing Model developed by Griffin, Dunwoody, and Neuwirth (1991) encompasses seven factors that influence information-seeking and processing: individual characteristics, perceived hazard characteristics, affective response to the risk, perceived social pressures to possess relevant information, information sufficiency, the capacity to learn, and beliefs about the usefulness of information in various channels. The dimension of risk adds to the concept of information-seeking in that risk gives meaning to the circumstances and things that pose danger to people (Stern & Fineberg, 1996). This indicates that seeking information in a risky situation differs from seeking information in a non-risky situation in that risk possibly poses harm or loss and therefore creates urgency.

According to the RISP model, information processing takes place via two routes, heuristically and systematically. This idea is based on the Heuristic Systematic Model (HSM), developed by Chaiken (1980, 1987), which served as a basis for the development of the RISP Model. The HSM describes systematic processing as "attempts to thoroughly understand any and all available information through careful attention, deep thinking, and intensive reasoning" (Chaiken & Ledgerwood, 2012, p. 247), which consumes high mental effort and only works when motivation and ability to attend are high enough. An example of systematic processing could be to carefully consider and analyse the arguments given, the way and the source by which the argument is presented, and the reasons for presenting the arguments. In contrast, heuristic processing only requires a fraction of this motivation and ability that is needed for systematic processing, as it is a more automatic process. Heuristic processing means to rely on easily retrieved and understood cues, like the presenter's status or group

membership, the number of arguments presented, or the reactions of the audience. All these cues are linked to intuitive and simple everyday decision rules, called heuristics. Heuristics such as “experts know best” or “consensus implies correctness” (p. 247) allow people to judge quickly without engagement in systematic thinking. Heuristics can be consciously employed but they also unintentionally influence judgements (Chaiken & Ledgerwood, 2012).

Dunwoody and Griffin (2015) define information-seeking as “a volitional process of selecting information channels to reach desired informational goals, as well as one of making choices to attend to messages embedded in any particular channel” (p.103). Similar to information processing, information-seeking can also take place via two routes. Firstly, information-seeking can take place heuristically, so through channels and heuristics used regularly, which the model identifies as routine. Secondly, one can seek information systematically by actively looking for information via channels that are not regularly used, which is therefore labelled as non-routine (see Figure 1). However, one can also actively decide to not seek out risk-related information, which is labelled as information avoidance (Dunwoody & Griffin, 2015). A meta-analysis of the RISP model conducted by Yang, Aloe, and Feely (2014) confirms the usefulness of the RISP model in predicting information-seeking and processing but found a limited explanatory power for heuristic processing.

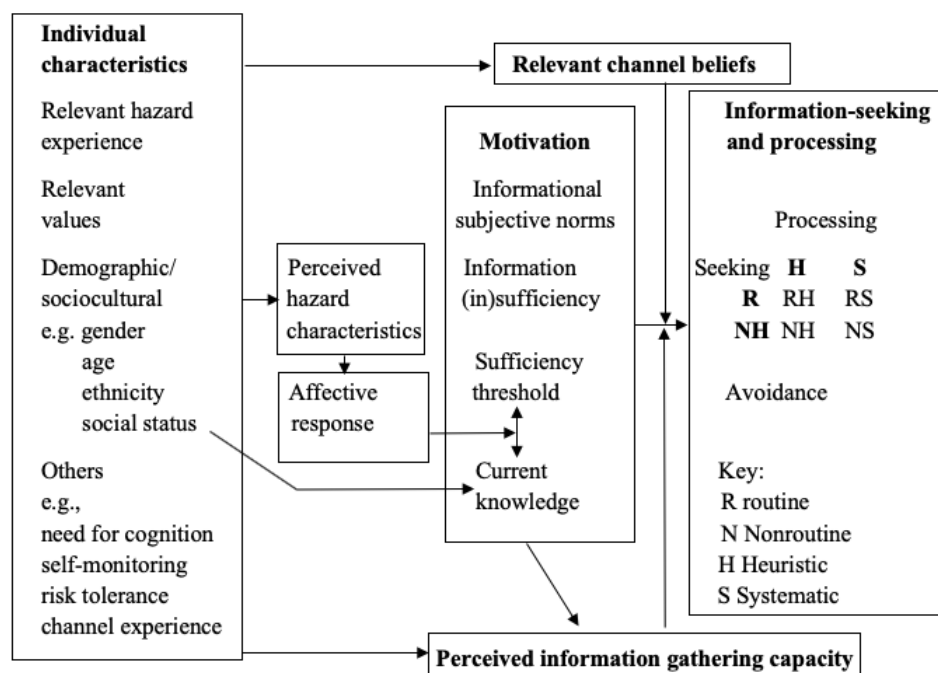


Figure 1: Risk Information-seeking and Processing Model (Griffin et al. 1997)

**1.1.2 Information Sufficiency and Sufficiency Threshold:** The Information Sufficiency of the RISP model is to a large extent based on Eagly and Chaiken's HSM model, which states that systematic information processing is dependent on one's need for sufficiency. Accordingly, one will exert the effort that is required to attain a sufficient degree of confidence that their processing goals have been accomplished (Eagly & Chaiken, 1993). Information sufficiency is, according to the RISP model, one of the most direct determinants of whether systematic information-seeking and processing takes place. As information-seeking and processing require a great amount of mental effort, one will only engage in it when sufficiently motivated (Dunwoody & Griffin, 2015). According to the model, subjective information gathering norms, as well as affective response, affect the confidence in one's knowledge one feels the need to have and therefore the information sufficiency threshold. The sufficiency principle ensures that individuals are occasionally motivated to engage in an additional cognitive effort to reach judgemental confidence. This balance point, where the preference for efficiently deploying cognitive effort and the motivation to reach accurate conclusions come together, is determined by a sufficiency threshold (Chaiken & Ledgerwood, 2012). This sufficiency threshold, then, reflects the degree to which an individual strives to be confident in a judgemental situation (Eagly & Chaiken, 1993). In line with the HSM model, it is proposed that when the sufficiency threshold is higher than the amount of the current level of information and knowledge, one will engage in more thorough and systematic information-seeking and processing (Griffin et al., 1997). In this study, the focus will lay on this current (actual) level of knowledge, which also represents the level of judgemental confidence and information sufficiency. Griffin, Neuwirth, Dunwoody, and Giese (2004) identified the two most direct determinants of information sufficiency as worry about the risk and the perception that others would expect one to keep abreast of information about the risk.

**1.1.3 Ease of Retrieval:** The concept of the ease of retrieval is highly based on a study by Tversky and Kahneman (1973), in which the concept of availability heuristics was developed. Accordingly, availability heuristics are employed "whenever he estimates frequency or probability by the ease with which instances or associations could be brought to mind" (Tversky & Kahneman, 1973, p.208). To assess the availability of such an instance or association, it is sufficient to assess the ease with which they can be carried out. The aforementioned experimental study by Schwarz et al. (1991) tested these assumptions and found out that the participants who had to recall 12 instead of six examples of assertive behaviour

people felt less assertive. So, the more assertive behaviours participants were asked to come up with, the less assertive they perceived themselves, even though they listed more assertive behaviours than the group who only listed six behaviour. Contradictory to all hypothesis, also the participants who had to list 12 unassertive behaviours, reported more assertiveness compared to the participants that had to report only six unassertive behaviours. This indicates that the perceived ease or difficulty of retrieval determines the implications of recalled content (Schwarz et al., 1991). What this shows is that the content of the recalled actions mattered less to the participants than the number of behaviours they had to list, which was enough to have an influence on their judgemental confidence. This finding is highly relevant for the current study as it implies that judgemental confidence can be influenced by an ease of retrieval manipulation.

**1.1.4 The Role of Gender:** The previously described study by Schwarz et al. (1991) also found that men were significantly more assertive, so more judgemental confident than women, which was disregarded due to no interaction with other experimental variables. However, the role of gender on judgemental confidence could be more important than assumed by previous research. In an experimental study exploring the phenomenon of overconfidence, Pulford (1996) found that males were significantly more overconfident than females. Female subjects rated a manipulation task as significantly harder than male subjects and even though generally harder tasks made the participants more overconfident, female subjects were found to be more underconfident. Nevertheless, Pulford also raises the question whether this difference is only found in reported confidence, possibly due to social desirability, and not in actual confidence. Either way, gender seems to have a profound effect on judgemental confidence and therefore, this study also aimed at examining the effect of gender, hypothesizing that men will be less affected by the manipulation task and therefore show a higher level of judgemental confidence in both, the easy and the difficult retrieval condition.

**1.1.5 The Current Study:** This study aimed at influencing judgemental confidence by an ease of retrieval manipulation and therefore, judgemental confidence was thought to also have an effect on the information-seeking and processing behaviour of the participants. The difficult and easy retrieval condition, to which participants were randomly assigned, are hypothesized to either minimize or boost the participant's judgemental confidence, respectively. The participants' diminished or boosted judgemental confidence was

hypothesized to then effect their information-seeking and processing behaviour. To summarize, the manipulation variable *Ease of Retrieval* is the independent variable, which is expected to have a direct effect on the dependent variables *Judgemental Confidence* and *Information Sufficiency* and *Systematic Processing*, *Heuristic Processing*, *Routine Information-Seeking* and *Non-Routine Information-Seeking*. To also explore the actual behaviour of dealing with the risk-related information, variables like *Time Spent on Article*, *Performance Multiple Choice Test*, and *Facts Recalled* were included as dependent variables, and it was controlled for the effect of the covariate *Involvement*. Moreover, *Gender* was hypothesized to also have an effect on the proposed model. The two resulting research hypotheses are:

**H1:** Greater ease of retrieval, as opposed to more difficult ease of retrieval, heightens the confidence in one's own knowledge (actual knowledge), and therefore leads to more heuristic processing compared to systematic processing, more routine information seeking compared to non-routine information-seeking, more information avoidance, less time spent on the about the risk-informing article and therefore also fewer elements recalled from this article and a worse performance on a knowledge test.

**H2:** Men have a higher level of judgemental confidence and therefore engage in more heuristic processing than systematic processing and more routine- than to non-routine information-seeking, in comparison to women.

## 2. Methods

### 2.1 Design and Participants

The current quantitative study comprised a convenience sample of 69 participants who took part in the study voluntarily. Most participants were recruited through the Test Subject Pool System (SONA), in which they obtained a reward in the form of points for participation. Other participants were contacted through the personal network of the researchers. Criteria to take part in this study were a sufficient understanding of English and a minimum age of 18 years. The research was approved by the BMS Ethics Committee (EC) of the University of Twente in March 2020. All participants were given a written informed consent prior to the conduct of the study, in line with the guidelines of the EC, as can be seen in Appendix A. In



total, 96 participants could be recruited. However, 27 participants did not complete the study and one participant denied giving consent after having been informed about the true nature of the study at the end. This leaves a sample of 69 participants, of which 38 were female and 30 were males (one participant preferred not to answer this question), ranging in age from 18 to 59 years ( $M = 25.45$ ,  $SD = 9.43$ ). Most participants ( $N = 31$ ) were of the German nationality, and the Dutch nationality ( $N = 25$ ). For most participants, the highest completed level of education was high school (Abitur, VWO, etc.). The participants were randomly assigned to either the easy-retrieval or difficult-retrieval condition, resulting in 36 (52.2 percent) and 33 (47.8 percent) participants per condition, respectively.

## 2.2 Procedure

As the experiment was done online, a link was distributed either directly by the researcher or indirectly through the SONA system. Each participant made use of their own laptop, computer, or phone to complete the survey. The online survey was conducted through the online questionnaire platform Qualtrics. Participants were randomly assigned to either the easy retrieval or the difficult retrieval condition through Qualtrics. Before the start of the experiment, the participant was asked to digitally sign an informed consent, which appeared on the screen. In the description, the participant was asked to read the informed consent carefully, as well as contacting the researcher as soon as any questions arise. Therefore, also the email address of the researchers appeared on the screen. After agreeing to all conditions, a field to continue appeared on the bottom right. With clicking this button, the experiment was started, and the participants were asked for age, gender, nationality, and highest completed level of education.

After agreeing to the informed consent and filling out the demographics, the ease of retrieval manipulation was shown. Participants in the easy-retrieval condition were asked to list three examples of actions that contribute to climate change and participants in the difficult-retrieval condition were asked to list eight actions with the following item:

“Please list three [eight] examples of human actions that contribute to the global warming of the planet.”

After listing the actions, it could be continued to a screen with the item to measure *Current Knowledge* and *Sufficiency Threshold* with one item each, based on a study by Griffin, Dunwoody, Neuwirth, and Giese (1999), who developed a reliable and peer-reviewed measurement of information sufficiency and risk information processing and seeking.

According to this study, information insufficiency can be measured by two self-report items, one relating to the current knowledge about the risk and the other one to the sufficiency threshold, so the perceived amount of information needed (Griffin et al., 1999).

Current Knowledge, in this study further described as *Judgemental Confidence*, was measured with the following item:

“First, we would like to rate your knowledge about this risk, please use a scale of zero to 100, where zero means knowing nothing and 100 means knowing everything you could possibly know about this topic. Using the given scale, how much do you think you currently know about the risk climate change poses?”

*Sufficiency threshold* was measured with a similar item, related to the perceived knowledge needed:

“Please use the same scale as before. This time, we would like you to estimate how much knowledge you would *need* to deal adequately with the possible risk climate change poses. Using a scale of zero to 100, how much information would be sufficient for you, that is, good enough for your purposes?”

Therefore, both Judgemental Confidence and Sufficiency Threshold were single-item measures, as suggested by Griffin et al. (1999). When the participants moved the slider to a number between zero and 100 as an answer to each question, 5 items relating to *Involvement* appeared. As there are greatly differing levels of knowledge and involvement when it comes to climate change, it was decided to control for the effect of Involvement. To find out how far the participants are involved into the topic of climate change, some items were selected from the Climate Stewardship Survey (Walker & McNeal, 2012), such as “How well informed are you about how the Earth’s climate system works.” The Cronbach’s Alpha of this scale was .73 and, therefore, acceptable. All items can be found in Appendix B.

After answering each of the five questions on a 5-point Likert scale, the participants could continue to the newspaper article. The newspaper article used to inform about a risk was “Fires and floods: Maps of Europe predict scale of climate catastrophe” (The Guardian, 2020), which informs about the risks of climate change, including flooding, desertification, and global heating. The article can be found in Appendix C. In the instructions above, it was stated to carefully read the newspaper article, which appeared below. Next, a question appeared that asked to list elements that could be recalled from the newspaper articles and the next page showed the three questions about the article that has just been read, such as:

“An average one-meter rise in sea-levels by the end of the century, without any flood

prevention action would mean how many percent of the surface of Hull would be underwater, according to the article?”.

Then, the participants continued to the questionnaire about risk information-seeking and processing and answer 15 questions on a five-point Likert scale. According to Griffin et al. (1999), *Risk Information Processing* can be measured with four items relating to *Heuristic Processing* and five items measuring *Systematic Processing*, like for example “If I need to act on this matter, the advice of one expert is enough for me” and “After I encounter information about this topic, I am likely to stop and think about it”. The Cronbach’s Alpha for items belonging to *Heuristic Processing* was .29, so unacceptable. Therefore, this measure will not be used for further analysis. For *Systematic Processing*, the Cronbach’s Alpha was .62, so acceptable. *Risk Information-Seeking* was measured with six items, including three items relating to *Avoidance* and three items relating to *Non-Routine* and *Routine Information-Seeking*, such as “Gathering information about this topic is a waste of time” and “When this topic comes up, I try to learn more about it” (Griffin et al., 1999). The Cronbach’s Alpha for *Avoidance* was .79 and for *Non-Routine Information-Seeking* .74, both interpreted as being acceptable. All 15 items on this scale were measured through a five-point Likert scale. All items can be found in Appendix B.

After having completed these questions, the last questionnaire concerning the level of trust in the national government regarding climate change was shown, which was of use for a research partner and will not be further analysed in this paper. After completing the last questionnaire, a debriefing took place as the participant could not be fully informed about the full purpose of the research before the experiment to not bias the results. Therefore, the participants were asked to confirm that they still consent that their data is being used after knowing that they were assigned to either the easy retrieval or difficult retrieval condition. Lastly, the participants were thanked for participating in the study. Conducting the study took the participants on average 24.68 minutes ( $SD = 15.56$ ).

### 3. Results

#### 3.1. Correlation Table

Firstly, a correlation table with all ordinal and numerical variables was created in order to get an overview of how variables correlate with each other, as can be seen in *Table 1*.

*Judgemental Confidence* is positively correlated with *Involvement*, indicating that someone

who is highly involved in the topic of climate change thought that his/her current knowledge is rather high,  $r = .50, p \leq .05$ . In addition, *Judgemental Confidence* is mildly positively correlated with *Systematic Processing* ( $r = .24, p \leq .05$ ) and mildly negatively correlated with *Information Avoidance* ( $r = -.34, p \leq .05$ ), indicating that high perceived current knowledge is associated with more systematic processing and less avoidance in information-seeking. Interestingly, *Judgemental Confidence* was also found to be low positively correlated with *Perceived Ease of Retrieval*, indicating that participants who perceived the task as easier were also more likely to have a higher judgemental confidence ( $r = .43, p < .01$ ). This finding displays that the manipulation probably has worked. *Perceived Ease of Retrieval* is low but significantly correlated with *Involvement*, indicating that someone who perceived the manipulation task as easier, is more likely to be highly involved into the topic of climate change ( $r = .36, p < .01$ ).

Furthermore, *Involvement* is negatively correlated with *Information Avoidance*, indicating that someone highly involved in climate change is less likely to avoid information,  $r = -.45, p \leq .05$ . *Systematic Processing* is, also as expected, negatively correlated with *Information Avoidance*,  $r = -.51, p \leq .05$ . Also, *Systematic Processing* was found strongly correlating with *Non-Routine Information-Seeking* ( $r = .65, p \leq .05$ ), displaying that someone likely to process information systematically, is also likely to seek information in a non-routine way. Furthermore, *Systematic Processing* was mildly positively correlated with *Facts Recalled* ( $r = .25, p \leq .05$ ) as well as *Performance Multiple Choice Test Article* ( $r = .40, p \leq .05$ ), meaning that a systematic processing style is associated with being able to recall more elements from the article, as well as performing better on the multiple-choice test about the article. Subsequently, *Facts Recalled* and *Performance Multiple Choice Test Article* are positively correlated,  $r = .28, p \leq .05$ . *Time Spent on Article* and *Performance Multiple Choice Test Article* are mildly, however, not significantly correlated ( $r = .21, p = .09$ ). Lastly, the demographic variable *Age* is mildly positively correlated with *Judgemental Confidence* ( $r = .24, p \leq .05$ ), indicating that higher age is associated with more confidence in one's own knowledge.

Table 1  
*Correlation of all ordinal and numerical variables*

	1	2	3	4	5	6	7	8	9	10	11
1. Judgemental Confidence											
2. Information Sufficiency	.17										
3. Involvement	.50**	-.04									
4. Systematic Processing	.24*	.13	.19								
5. Information Avoidance	-.34**	-.07	-.45**	-.51**							
6. Non-Routine Information-Seeking	.19	.09	.23	.65**	-.55**						
7. Routine Information-Seeking	.13	-.11	.24	-.06	-.10	.036					
8. Facts Recalled	.04	.03	.16	.25*	-.23	.11	.05				
9. Performance Multiple Choice Test	.07	-.08	.05	.40**	-.20	.17	-.17	.28*			
10. Time Spent on Article	.06	.10	.09	.13	-.13	.08	-.24*	.07	.21		
11. Perceived Ease of Retrieval	.43**	-.02	.36**	.15	-.20	.11	-.01	.17	-.05	.19	
12. Age	.24*	-.09	.10	.11	.04	.19	-.05	-.16	-.03	-.05	.093

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

### 3.2 Manipulation Check

To test whether participants in the difficult retrieval condition, who had to name eight human actions that contribute to climate change perceived this task as more difficult than people in the easy retrieval condition, who had to list only three human actions, a manipulation check has been conducted with a chi-square. Within the easy retrieval condition ( $N = 36$ ), 2.8 percent of the participants described the task as extremely difficult or somewhat difficult, and 86.1 percent as extremely easy or somewhat easy. Within the difficult retrieval condition ( $N = 33$ ), 60.6 percent of the participant labeled their task as extremely or somewhat difficult, while 24.2 percent thought it was extremely or somewhat easy (see Figure 2). Therefore, participants in the easy retrieval condition perceived it as easier to come up with three actions that contribute to climate change ( $M = 2.83$ ,  $SD = 0.45$ ) than the difficult retrieval condition perceived their task of listing eight actions ( $M = 1.64$ ,  $SD = 0.86$ ). This difference was found to be statistically significant,  $t(67) = 7.34$ ,  $p < .01$ .

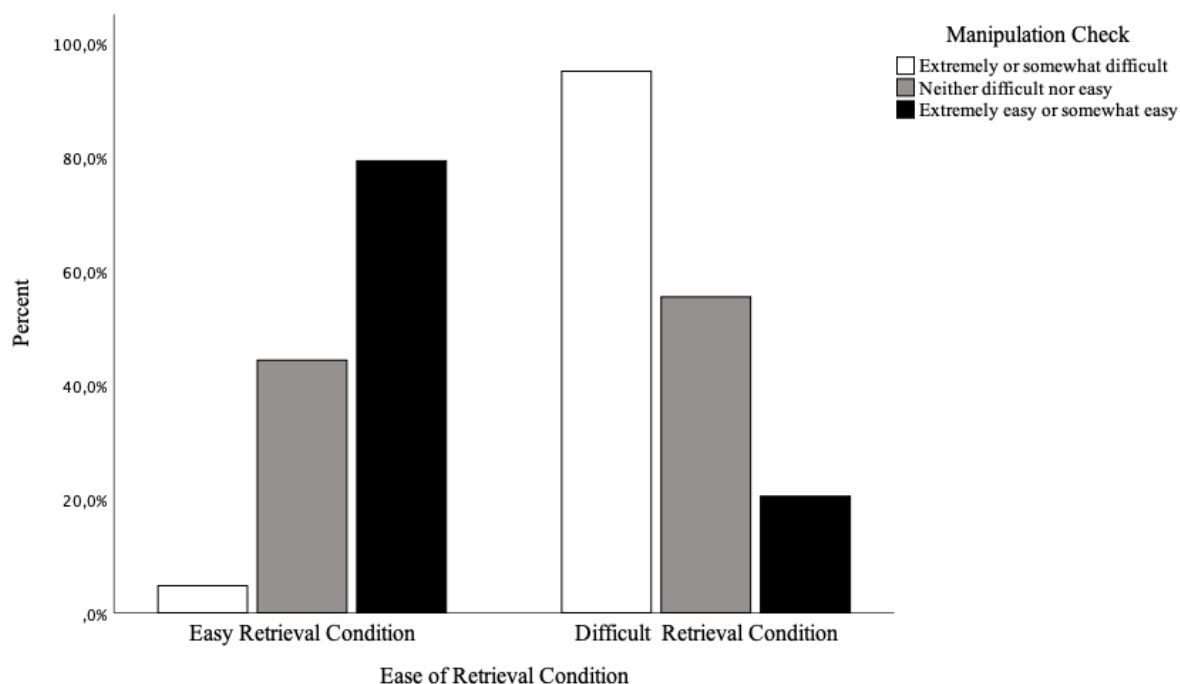


Figure 2: Perceived Difficulty of the Manipulation Task per Condition

### 3.3 The effect of Ease of Retrieval and Gender on Risk Information Seeking and Processing

In order to answer the research question to what extent does the perceived ease or difficulty of retrieval affect the confidence in one's own knowledge and therefore the motivation to seek and process risk-related information and to reject or approve both hypotheses, a MANCOVA has been conducted. More specifically, the relationship between the independent variables *Ease of Retrieval* and *Gender*, the covariate *Involvement* and the dependent variables *Judgemental Confidence*, *Information Sufficiency*, *Systematic Processing*, *Non-Routine Information-Seeking*, *Routine Information-Seeking*, *Information Avoidance*, as well as *Facts Recalled*, *Performance Multiple Choice Test Article*, and *Time Spent on Article*, was analyzed. Regarding the assumptions of the MANOVA, all assumptions have been met except for the homogeneity of variance assumption, measured by the Box's M test and the multivariate normality assumption. However, due to a lack of non-parametric alternatives of statistical tests with more than one dependent variable and as MANOVA is a relatively robust statistical test, it was continued with a MANOVA. In addition, according to Allen and Bennet (2008), MANOVA is robust for violations against the homogeneity of variance assumption in

case the  $N$  per group is higher than 30, which is the case for the current study. Nevertheless, as two assumptions have been violated, the Pillai's Trace was interpreted for determining the significance because it is the most robust and powerful test, especially when assumptions are being violated.

The main effect of *Ease of Retrieval* on the dependent variables *Judgemental Confidence*, *Information Sufficiency*, *Systematic Processing*, *Non-Routine Information-Seeking*, *Routine Information-Seeking*, *Information Avoidance*, as well as *Facts Recalled*, *Performance Multiple Choice Test Article*, and *Time Spent on Article* was found to be non-significant,  $F(9, 55) = 0.81$ ;  $p = .61$ ;  $\text{partial } n^2 = .12$ . Therefore, the ease-of retrieval condition did not cause a significant difference in the dependent variables. All main effects as well as the univariate effects can be found in Appendix D. To ensure that the ease of retrieval manipulation did not have an influence on the covariate *Involvement* (*Involvement* was measured after the manipulation has taken place), an ANOVA was conducted. There was no significant effect found of *Ease of Retrieval* on *Involvement*,  $F(1, 67) = 0.15$ ,  $p = .70$ .

The second main effect, namely the effect of *Gender* on the dependent variables was also found to be non-significant  $F(18, 112) = 1.28$ ;  $p = .22$ ;  $\text{partial } n^2 = .17$ . Therefore, also gender has not been found to generate a significant difference in the dependent variables. Interestingly, *Gender* did elicit two significant results when looking at the univariate ANOVAs. There was a significant effect found of *Gender* on *Non-Routine Information-seeking*,  $F(2, 63) = 3.96$ ,  $p = .02$ . Females engaged in more non-routine information-seeking, meaning that they display more actively looking for information via channels that are not regularly used, compared to males ( $M = 3.71$ ,  $SD = 0.81$  versus  $M = 3.27$ ,  $SD = 0.90$ ). Accordingly, there was a statistically significant effect found of *Gender* on *Routine Information-seeking*,  $F(2, 63) = 3.66$ ,  $p = .03$ , indicating that males sought information more routinely ( $M = 3.77$ ,  $SD = 0.73$ ), compared to females ( $M = 3.53$ ,  $SD = 0.86$ ). However, the hypothesis that there is an effect of *Gender* on *Information-seeking and Processing*, cannot be approved due to a non-significant multivariate effect.

The interaction effect between *Ease of Retrieval* and *Gender* on the dependent variables was not found to be statistically significant either,  $F(9, 55) = 1.42$ ;  $p = .20$ ;  $\text{partial } n^2 = .19$ . Nevertheless, it has an increased significance as well as an increased effect size compared to the two individual main effects.

The effect of the covariate *Involvement* on the dependent variables was found to be statistically significant,  $F(9, 55) = 1.42$ ;  $p < .01$ ;  $\text{partial } n^2 = .39$ . When further analysing the univariate ANOVAs of *Involvement* on the dependent variables, there was a significant effect

found of *Involvement* on *Non-Routine Processing* ( $F(1, 63) = 5.84, p = .02$ ), *Routine Information Processing* ( $F(1, 63) = 6.20, p = .02$ ), *Information Avoidance* ( $F(1, 63) = 17.88, p < .01$ ), and *Judgemental Confidence* ( $F(1, 63) = 18.85, p < .01$ ). High involvement was found to lead to significantly more *Non-Routine Information Seeking* ( $B = 0.44, SE = 0.18, p \leq .05$ ) as well as to lead to more *Routine Information Seeking* ( $B = 0.42, SE = 0.17, p \leq .05$ ). High involvement also leads to significantly less *Information Avoidance* ( $B = -0.62, SE = 0.15, p \leq .05$ ). Lastly, high involvement lead to significantly more *Judgemental Confidence* ( $B = 0.80, SE = 0.18, p \leq .05$ ).

#### 4. Discussion

The research question aimed to be answered in this paper was “To what extent does the perceived ease or difficulty of retrieval affect the confidence in one’s own knowledge and therefore the motivation to seek and process risk-related information?”. It was hypothesized that greater ease of retrieval, as opposed to more difficult ease of retrieval, heightens the confidence in one’s own knowledge (actual knowledge), and therefore leads to more heuristic processing compared to systematic processing, more routine information-seeking compared to non-routine information-seeking, more information avoidance, less time spent on the about the risk-informing article and therefore also fewer elements recalled from this article and a worse performance on the knowledge test. Due to non-significant results, these hypotheses cannot be approved. However, most of the results do point in the hypothesized direction. The participants in the easy retrieval condition showed slightly higher scores on *Judgemental Confidence* and *Information Avoidance*, and lower scores on *Systematic Processing* and *Information Sufficiency* recalled slightly fewer facts from the article and performed slightly worse on the multiple-choice test, compared to the difficult retrieval condition. These results are in line with the Chaiken and Ledgerwood’s research (2012) about the sufficiency principle. People in the difficult retrieval condition showed a slightly lower judgemental confidence as it was manipulated by the difficult retrieval task, which has to be taken with caution as results were not found to be significant. Nevertheless, all effects were found to be insignificant so generalization as well as comparison with previous studies has to be done with caution.

Contradictory to these results is the mildly positive correlation between the variables *Judgemental Confidence* and *Systematic Processing*, which displays that people who are more confident in their current knowledge do also engage in more systematic processing, while the



opposite should be the case to be in line with the research hypothesis. One possible explanation for this could be the variable *Involvement*. According to Leippe and Elkin (1987), involvement in the topic does encourage systematic processing of new information and might also positively influence judgemental confidence. In a study by Chebat and Picard (1985) where the confidence in a product was investigated with personal involvement as a mediator, a direct effect of involvement on confidence was found: the higher the involvement, the higher the confidence. It is possible that very much into climate change involved people engage into more systematic processing because of their general interest but are also more confident about their current knowledge (more judgemental confident) because of the time they spent seeking and processing climate change related information in the past.

However, what was not found to be in line with the research hypothesis is that participants in the easy retrieval condition showed higher scores on both Routine and Non-Routine Information Seeking and spent longer reading the articles compared to participants in the difficult retrieval condition. Similarly, involvement had a significant effect on both routine and non-routine information-seeking in that higher involvement led to more routine and more non-routine information seeking. One possible information for that is that highly involved as well as more judgemental confident participant through the easy retrieval manipulation just looked for more information in general. So, they did not just engage in more active, non-routine information but also let information reach them in a more passive, routine way.

The second research hypothesis was that men would have a higher sufficiency threshold in both conditions and therefore a lowered motivation to look for risk-related information in comparison to women. This hypothesis could also not be confirmed, as the main effect of gender on the dependent variables was found to be insignificant. Nevertheless, the effect of gender on routine and non-routine Information-seeking was found to be statistically significant, in a direction that is absolutely in line with what Schwarz et al. (1991), in whose study men were found to be more assertive, therefore more judgementally confident, than women. It can be assumed, based on the study by Schwarz et al. (1991) and the findings of this study, that men might be more assertive and therefore less motivated to engage in non-routine information-seeking compared to women.

Another interesting finding is the significance of the effect of Involvement in the proposed model. High involvement leads to a lower level of avoiding information, less engagement in less routine information-seeking, so participants went less out of their way to search for information and had higher judgemental confidence. By finding an insignificant effect of the manipulation condition on Involvement, it is excluded that there is not a

consistent effect of Involvement across the two groups. This brings up the impression that the influence of involvement in the risk topic on judgemental confidence and therefore also on information-seeking and processing might be greater than anticipated by previous literature such as the RISP model by Griffin et al. (1997). Chaiken (1980) did establish a link between low-risk involvement and more heuristic processing, as well as between high-risk involvement and putting more value on reliability and accuracy of the information. Also Kievik, ter Huurne, and Gutteling (2012) emphasized the role of involvement in the motivation to look for information and actually make behavioural changes. However, a direct link between involvement and judgemental confidence has not been established yet, which needs to be addressed in future research, as shown by this study.

#### **4.1 Limitations and Recommendations**

To interpret the results of this study it is important to also discuss whether the ease of retrieval manipulation actually worked. Statistically, people in the difficult retrieval condition labelled their task significantly more as extremely or somewhat difficult compared to the easy retrieval condition and vice versa. As described earlier, Schwarz et al. (1991) showed that the degree to which people feel ease of retrieval has a major influence on the information that can be retrieved. However, even though participants perceived their task as rather difficult or extremely difficult, we have no information about whether their judgemental confidence has actually been manipulated as we only tested the perceived difficulty and did not measure the actual judgemental confidence.

The choice for developing the task of listing three human actions that contribute to climate change in the easy retrieval condition and eight in the difficult retrieval condition was based on a study by Schwarz et al. (1991) which established that listing 12 unassertive behaviours made participants feeling more assertive and therefore more confident than listing six assertive behaviours. The number of behaviours that had to be listed in this study was minimized because listing human actions contributing to climate change was perceived as more difficult than listing assertive or unassertive behaviours. One reason why this study has not found such a difference in judgemental confidence, as found by Schwarz et al. (1991), might be the low statistical power. The low power of the investigated model is one of the most prominent limitations of this study, given the complexity of the analysis in combination with the relatively small sample. Such a low power a research model reduces the chances to reveal an actually existing effect (Button et al., 2013).

Another reason might be that the discrepancy in perceived difficulty between the easy and the difficult condition might have been too small to cause a significant difference in judgemental confidence. What speaks against this claim and in favour of the manipulation used in this study is the significant positive correlation found between judgemental confidence and perceived ease of retrieval. However, this correlation was only found to be low and since correlation does not imply causation (Papineau, 1991) it is also possible that people with a generally higher level of judgemental confidence, regardless of the condition, were more likely to perceive the manipulation task as easier. Future research should increase this discrepancy in order to investigate the influence of judgemental confidence on information-seeking and processing further.

Another limitation and possible reason for insignificant results might be the risk situation chosen for this study. According to Stern and Fineberg (1996), seeking information in a risky situation differs from seeking information in a non-risky situation in that risk possibly poses harm or loss and therefore creates urgency. According to Lorenzoni and Hulme (2009), the majority sees climate change as an issue that does not require action in the near future, nor concerns their specific environment. Such a psychological distance from climate change was also an important point of concern in the European Perceptions of Climate Change Project (EPCC) in 2016. According to this survey, the majority of people in Germany, the United Kingdom, France, and Norway are of the opinion that they are feeling the effect of climate change. However, most participants also are of the opinion that other countries are more likely to be affected by climate change than their own (Steentjes et al., 2017). In conclusion, it is likely that climate change is not a risk that creates enough urgency to evoke significant differences in judgemental confidence and therefore also differences in information processing and seeking.

An additional limitation of this research was the items used to measure heuristic processing, which has been identified as not reliable enough to be included in the analysis. Therefore, the effect of ease of retrieval on heuristic processing could not be investigated, which should be picked up on by future research in this field. Lastly, the sample choice showed up some problems. Foremost, the size of the sample is too small to make claims about generalizable results and as the sample was a convenience sample, bias can arise. Participants were recruited through the personal network of the researchers and through the SONA platform. Therefore, a non-random sample has been generated and results have to be taken with caution.

This research was a starting point to explore the effect of judgemental confidence and

information-seeking and processing by manipulating judgemental confidence directly. Unfortunately, non-significant effects have been generated, most likely due to the limitations mentioned. Further research should concentrate on eliminating these limitations and conducting broader scale research with an effective ease of retrieval manipulation and reliable measures of information-seeking and processing to further investigate the true nature of the influence of judgemental confidence. Additionally, this research emphasized the importance of involvement in the risk as an important factor in this relationship. It also showed that involvement has not been taken into account enough by past research when it comes to risk information-seeking and processing.

## **5. Conclusion**

This research aimed at answering the research question to what extent the perceived ease or difficulty of retrieval affects the confidence in one's own knowledge and therefore the motivation to seek and process risk-related information. Based on the results of this study, it might be assumed that judgemental confidence plays no or a very small role in seeking and processing information as participants in the difficult retrieval condition did not engage significantly more in systematic processing and non-routine information-seeking, nor significantly less information avoidance. However, most results do point in the hypothesized direction which creates the need for more research to be done on the role of judgemental confidence. While low power problems as well as the problem that the chosen risk might have not posed enough urgency limit the generalizability of these results, it does highlight the role involvement into a certain risk plays in information-seeking and processing. Further research is needed not only to explore and highlight this significant role of involvement further but to also further investigate how high or low judgemental confidence influences information-seeking and processing behaviour.

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## Appendices

### Appendix A

#### Informed Consent

Thank you very much for wanting to participate in our research, which examines the influence of judgemental confidence on climate change-related risk-information-seeking and processing. This study is done by Annik Megens and Julia Hubbert, two third-year Psychology students at the University of Twente. Please read the following information carefully.

The aim of this study is to investigate the role judgemental confidence plays in seeking out and processing risk-related information about the topic of climate change, as well as examining the roles of current knowledge and trust in government. Completing this study will take you approximately 20 to 30 minutes.

Participation in this study is completely voluntary and please keep in mind that you can withdraw from the study at any time without having to give a reason. At the end of the study, you will be giving another chance to withdraw. The information given will be anonymized and treated strictly confidential. We do not expect any risks being associated with this study.

If you have any further questions or comments, please contact the researchers:

Annik Megens ([a.megens@student.utwente.nl](mailto:a.megens@student.utwente.nl))

Julia Hubbert ([j.m.hubbert@student.utwente.nl](mailto:j.m.hubbert@student.utwente.nl))

If you have questions about your rights as a research participant, or wish to obtain information, ask questions, or discuss any concerns about this study with someone other than the researcher(s), please contact the Secretary of the Ethics Committee of the Faculty of Behavioural, Management and Social Sciences at the University of Twente by [ethicscommittee-bms@utwente.nl](mailto:ethicscommittee-bms@utwente.nl).

I understand and consent that:

1. I am at least 18 years old.
2. I understand the content and voluntarily participate in this study.
3. I can refuse to answer questions and withdraw from participation at any time without having to give a reason. By contacting the researcher, I can have all my data deleted.
4. My data will be treated confidentially. All analysis of the given data occurs anonymized and only for the purpose of the study.
5. I agree that all my data can be evaluated and used for the research in case I do not withdraw or indicate otherwise.
6. I have been given the guarantee that this study has been reviewed and approved by the BMS Ethics Committee.

☐ Yes, I do consent.

☐ No, I do not consent.



## Appendix B

### Questionnaire

#### Items Measuring Involvement

1. How concerned are you about Global warming?
2. How well informed are you about how the Earth's climate system works?
3. How well informed are you about the causes of global warming?
4. How well informed are you about the consequences of global warming?
5. How well informed are you about the methods to reduce global warming?

### Questionnaire Systematic and Heuristic Risk Information Processing

#### Systematic Processing:

1. After I encounter information about this topic, I am likely to stop and think about it.
2. If I need to act on this matter, the more viewpoints I get the better.
3. It is important for me to interpret information about this topic in a way that applies directly to my life.
4. After thinking about this topic, I have a broader understanding.
5. When I encounter information about this topic, I read or listen to most of it, even though I may not agree with its perspective.

#### Heuristic Processing:

6. When I encounter information about this topic, I focus on only a few key points.
7. If I need to act on this matter, the advice of one expert is enough for me.
8. When I see or hear information about this topic, I rarely spend much time thinking about it.
9. There is far more information on this topic than I personally need.

### Questionnaire Risk Information-seeking

#### Avoidance:

10. Whenever this topic comes up, I go out of my way to avoid learning more about it.
11. When this topic comes up, I'm likely to tune it out.
12. Gathering information about this topic is a waste of time.

### Non-Routine vs. Routine Seeking

13. When it comes to this topic, I'm likely to go out of my way to get more information.
14. When this topic comes up, I try to learn more about it.
15. When it comes to this topic, I'm content to let information come to me in the course of my daily life.

## Appendix C

## Newspaper Article

## Fires and floods: maps of Europe predict scale of climate catastrophe

**Without urgent action, rising sea levels by end of century could leave cities under water**



▲ A digitally manipulated image showing a flooded Rotterdam. Photograph: Alexandre Rotenberg/Alamy

A **series of detailed maps** have laid bare the scale of possible forest fires, floods, droughts and deluges that Europe could face by the end of the century without urgent action to adapt to and confront global heating.

An average one-metre rise in sea levels by the end of the century - without any flood prevention action - would mean 90% of the surface of Hull would be under water, according to the European Environment Agency.

English cities including Norwich, Margate, Southend-on-Sea, Runcorn and Blackpool could also experience flooding covering more than 40% of the urban area.

Across the North Sea, Dutch cities including the Hague, Rotterdam and Leiden were predicted to face severe floods from an average one metre sea-level rise, which is forecast if emissions rise 4C-6C above pre-industrial levels.

The model does not account for the Netherlands' extensive flood-prevention measures, although many other countries have not taken such action.

Meanwhile, large areas of Spain, Portugal and France would be grappling with desertification, with the worst-affected zones experiencing a two and half-fold increase in droughts under the worst-case scenario.

Hotter summers increase the risk of forest fires, which **hit record levels in Sweden in 2018**. If emissions exceed 4C, France, southern Germany, the Balkans and the Arctic Circle could experience a greatly increased fire risk. However, the absolute fire danger would remain highest in southern European countries, which are already prone to blazes.

Further north, winters are becoming wetter. Failure to limit global heating below 2C could mean a swath of central and eastern **Europe**, from Bratislava in the west to Yaroslavl in the east, will be in line for sharp increase in "heavy rain events" during autumn and winter by the end of the century.

In some areas of central and eastern Europe there is predicted to be a 35% increase in heavy rain events, meaning torrential downpours would be more frequent.



▲ Map predicting flood-hit areas. Photograph: Center for Remote Sensing of Ice Sheets/Eurostat



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While the climate data has been published before, this is the first time the EU-agency has presented it using detailed maps on one site. Users can zoom in on small areas, for example, to discover that one-third of the London borough of Hammersmith and Fulham could be exposed to flooding by 2071.

The Copenhagen-based agency hopes the maps will reach decision-makers in governments and EU institutions, who would not usually read a lengthy EEA report on the impact of the climate emergency.

“It’s very urgent and we need to act now,” said Blaž Kurnik, an EEA expert in climate change impacts and adaptation.

Even if countries succeed in restricting global temperature rise, existing CO<sub>2</sub> in the atmosphere would still have an impact, he said.

“The number of extreme events and sea level rise will still continue to increase for the next decades to a century,” Kurnik said. “Sea level rise, especially, can be problematic, because it is still increasing because of past emissions and the current concentration of greenhouse gases.”

The agency wants governments to focus on adapting to unavoidable global heating. “Adaptation is crucial in the next decades of the century. Even if we are able to increase the temperature by 2C, adaptation is crucial for the next decades.”

The EEA has concluded it is **possible to limit the rise in global temperatures to 2C above pre-industrial levels**, as long as greenhouse gas concentrations peak during the next 15 to 29 years.

Meeting a more demanding **1.5C limit** requires concentrations to peak in the next three to 13 years. Under both scenarios, there is a 50% chance of overshooting the temperature.

## Appendix D

## Main and Univariate Effects of the Proposed Research Model

*Descriptive Statistics*

	Gender	Ease of Retrieval	M	SD	N
Systematic Processing	Male	Easy Retrieval Condition	3.63	0.60	15
		Difficult Retrieval Condition	3.53	0.72	15
		Total	3.58	0.66	30
	Female	Easy Retrieval Condition	3.63	0.51	21
		Difficult Retrieval Condition	3.94	0.43	17
		Total	3.77	0.50	38
	Other	Difficult Retrieval Condition	4.40	.	1
		Total	4.40	.	1
	Total	Easy Retrieval Condition	3.63	0.54	36
		Difficult Retrieval Condition	3.77	0.61	33
		Total	3.70	0.58	69
Non-Routine Information Seeking	Male	Easy Retrieval Condition	3.20	0.94	15
		Difficult Retrieval Condition	3.33	0.88	15
		Total	3.27	0.90	30
	Female	Easy Retrieval Condition	3.62	0.85	21
		Difficult Retrieval Condition	3.82	0.77	17
		Total	3.71	0.81	38
	Other	Difficult Retrieval Condition	4.50	.	1
		Total	4.50	.	1
	Total	Easy Retrieval Condition	3.44	0.90	36
		Difficult Retrieval Condition	3.62	0.85	33
		Total	3.53	0.87	69
Information Avoidance	Male	Easy Retrieval Condition	1.89	0.97	15

		Difficult Retrieval Condition	1.69	0.58	15
		Total	1.79	0.80	30
Routine Information Seeking	Female	Easy Retrieval Condition	1.73	0.70	21
		Difficult Retrieval Condition	1.65	0.76	17
		Total	1.69	0.72	38
	Other	Difficult Retrieval Condition	1.00	.	1
		Total	1.00	.	1
	Total	Easy Retrieval Condition	1.80	0.82	36
		Difficult Retrieval Condition	1.65	0.67	33
		Total	1.72	0.75	69
Time Spent on Article	Male	Easy Retrieval Condition	3.87	0.64	15
		Difficult Retrieval Condition	3.67	0.82	15
		Total	3.77	0.73	30
	Female	Easy Retrieval Condition	3.33	0.80	21
		Difficult Retrieval Condition	3.76	0.90	17
		Total	3.53	0.86	38
	Other	Difficult Retrieval Condition	2.00	.	1
		Total	2.00	.	1
	Total	Easy Retrieval Condition	3.56	0.77	36
		Difficult Retrieval Condition	3.67	0.89	33
		Total	3.61	0.83	69
	Male	Easy Retrieval Condition	194.88	159.06	15
		Difficult Retrieval Condition	159.97	91.70	15
		Total	177.42	128.80	30
	Female	Easy Retrieval Condition	639.48	2118.61	21
		Difficult Retrieval Condition	172.44	146.42	17
		Total	430.54	1578.2518	38

	Other	Difficult Retrieval Condition	147.46	.	1
		Total	147.46	.	1
	Total	Easy Retrieval Condition	454.23	1620.00	36
		Difficult Retrieval Condition	166.01	120.20	33
		Total	316.39	1174.15	69
Facts Recalled	Male	Easy Retrieval Condition	4.93	2.79	15
		Difficult Retrieval Condition	4.47	2.70	15
		Total	4.70	2.71	30
	Female	Easy Retrieval Condition	4.05	2.31	21
		Difficult Retrieval Condition	4.18	2.01	17
		Total	4.11	2.15	38
	Other	Difficult Retrieval Condition	9.00	.	1
		Total	9.00	.	1
	Total	Easy Retrieval Condition	4.43	2.52	36
		Difficult Retrieval Condition	4.45	2.43	33
		Total	4.43	2.46	69
	Performance Multiple Choice Test Article	Male	Easy Retrieval Condition	1.40	0.83
Difficult Retrieval Condition			1.73	0.80	15
Total			1.57	0.82	30
Female		Easy Retrieval Condition	1.71	0.85	21
		Difficult Retrieval Condition	1.76	0.75	17
		Total	1.74	0.79	38
Other		Difficult Retrieval Condition	300	.	1
		Total	3.00	.	1
Total		Easy Retrieval Condition	1.58	0.84	36
		Difficult Retrieval Condition	1.79	0.78	33
		Total	1.68	0.81	69



Judgemental Confidence	Male	Easy Retrieval Condition	3.67	0.82	15
		Difficult Retrieval Condition	3.53	0.92	15
		Total	3.60	0.86	30
	Female	Easy Retrieval Condition	3.62	0.92	21
		Difficult Retrieval Condition	3.06	1.14	17
		Total	3.37	1.05	38
	Other	Difficult Retrieval Condition	4.00	.	1
		Total	4.00	.	1
	Total	Easy Retrieval Condition	3.64	0.87	36
		Difficult Retrieval Condition	3.30	1.05	33
		Total	3.48	0.96	69
Information Sufficiency	Male	Easy Retrieval Condition	3.60	1.40	15
		Difficult Retrieval Condition	3.93	0.96	15
		Total	3.77	1.19	30
	Female	Easy Retrieval Condition	4.14	1.06	21
		Difficult Retrieval Condition	3.88	0.93	17
		Total	4.03	1.00	38
	Other	Difficult Retrieval Condition	5.00	.	1
		Total	5.00	.	1
	Total	Easy Retrieval Condition	3.92	1.23	36
		Difficult Retrieval Condition	3.94	1.93	33
		Total	3.93	1.09	69

*Multivariate Tests<sup>a</sup>*

		Hypothesis					
Effect		Value	F	df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	0.77	20.59 <sub>b</sub>	9.00	55.00	.00	.77
	Wilks' Lambda	0.23	20.59 <sub>b</sub>	9.00	55.00	.00	.77
	Hotelling's Trace	3.37	20.59 <sub>b</sub>	9.00	55.00	.00	.77
	Roy's Largest Root	3.37	20.59 <sub>b</sub>	9.00	55.00	.00	.77
Involvement	Pillai's Trace	0.39	3.98 <sub>b</sub>	9.00	55.00	.00	.39
	Wilks' Lambda	0.61	3.98 <sub>b</sub>	9.00	55.00	.00	.39
	Hotelling's Trace	0.65	3.98 <sub>b</sub>	9.00	55.00	.00	.39
	Roy's Largest Root	0.65	3.98 <sub>b</sub>	9.00	55.00	.00	.39
Gender	Pillai's Trace	0.34	1.28	18.00	112.00	.22	.17
	Wilks' Lambda	0.69	1.26 <sub>b</sub>	18.00	110.00	.23	.17
	Hotelling's Trace	0.41	1.24	18.00	108.00	.24	.17
	Roy's Largest Root	0.25	1.55 <sub>c</sub>	9.00	56.00	.15	.20
Ease Of Retrieval	Pillai's Trace	0.12	0.81 <sub>b</sub>	9.00	55.00	.61	.12
	Wilks' Lambda	0.88	0.81 <sub>b</sub>	9.00	55.00	.61	.12
	Hotelling's Trace	0.13	0.81 <sub>b</sub>	9.00	55.00	.61	.12
	Roy's Largest Root	0.13	0.81 <sub>b</sub>	9.00	55.00	.61	.12
Gender * Ease Of Retrieval	Pillai's Trace	0.19	1.42 <sub>b</sub>	9.00	55.00	.20	.19
	Wilks' Lambda	0.81	1.42 <sub>b</sub>	9.00	55.00	.20	.19
	Hotelling's Trace	0.23	1.42 <sub>b</sub>	9.00	55.00	.20	.19
	Roy's Largest Root	0.23	1.42 <sub>b</sub>	9.00	55.00	.20	.19

a. Design: Intercept + Involvement + Gender + EaseOfRetrieval + Gender \* EaseOfRetrieval

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

*Test of Between-Subjects Effects*

Source	Dependent Variable	df	F	Sig.	Partial Eta Squared
Corrected Model	Systematic Processing	5	2.11	.08	.14
	Non-Routine Information Seeking	5	2.57	.04	.17
	Information Avoidance	5	4.03	.00	.24
	Routine Information Seeking	5	3.16	.01	.20
	Time Spent on Article	5	0.60	.70	.05
	Facts Recalled	5	1.10	.37	.08
	Performance Multiple Choice Test Article	5	0.96	.45	.07
	Judgemental Confidence	5	4.95	.00	.28
	Information Sufficiency	5	0.65	.66	.05
Intercept	Systematic Processing	1	42.84	.00	.41
	Non-Routine Information Seeking	1	10.16	.00	.14
	Information Avoidance	1	45.94	.00	.42
	Routine Information Seeking	1	7.45	.01	.11
	Time Spent on Article	1	0.30	.59	.01
	Facts Recalled	1	3.91	.05	.06
	Performance Multiple Choice Test Article	1	7.04	.01	.10
	Judgemental Confidence	1	1.19	.28	.02
	Information Sufficiency	1	24.52	.00	.28
Involvement	Systematic Processing	1	3.84	.06	.06
	Non-Routine Information Seeking	1	5.84	.02	.08
	Information Avoidance	1	17.88	.00	.22
	Routine Information Seeking	1	6.20	.02	.09
	Time Spent on Article	1	0.77	.38	.01
	Facts Recalled	1	0.70	.41	.01

	Performance Multiple Choice Test Article	1	0.10	.76	.00
	Judgemental Confidence	1	18.85	.00	.23
	Information Sufficiency	1	0.16	.69	.00
Gender	Systematic Processing	2	2.17	.12	.06
	Non-Routine Information Seeking	2	3.96	.02	.11
	Information Avoidance	2	1.18	.31	.03
	Routine Information Seeking	2	3.66	.03	.10
	Time Spent on Article	2	.47	.63	.02
	Facts Recalled	2	1.69	.19	.05
	Performance Multiple Choice Test Article	2	1.48	.24	.05
	Judgemental Confidence	2	0.04	.97	.00
	Information Sufficiency	2	0.88	.42	.03
EaseOfRetrieval	Systematic Processing	1	0.90	.35	.01
	Non-Routine Information Seeking	1	1.03	.32	.01
	Information Avoidance	1	1.37	.25	.02
	Routine Information Seeking	1	0.64	.43	.01
	Time Spent on Article	1	0.63	.43	.01
	Facts Recalled	1	0.05	.83	.00
	Performance Multiple Choice Test Article	1	0.97	.33	.02
	Judgemental Confidence	1	1.78	.19	.03
	Information Sufficiency	1	0.01	.92	.00
Gender * EaseOfRetrieval	Systematic Processing	1	2.67	.11	.04
	Non-Routine Information Seeking	1	0.13	.72	.00
	Information Avoidance	1	0.00	.98	.00
	Routine Information Seeking	1	3.47	.07	.05
	Time Spent on Article	1	0.45	.50	.01
	Facts Recalled	1	0.31	.58	.01
	Performance Multiple Choice Test Article	1	0.47	.50	.01

	Judgemental Confidence	1	0.48	.49	.01
	Information Sufficiency	1	1.27	.26	.02
Error	Systematic Processing	63			
	Non-Routine Information Seeking	63			
	Information Avoidance	63			
	Routine Information Seeking	63			
	Time Spent on Article	63			
	Facts Recalled	63			
	Performance Multiple Choice Test Article	63			
	Judgemental Confidence	63			
	Information Sufficiency	63			
Total	Systematic Processing	69			
	Non-Routine Information Seeking	69			
	Information Avoidance	69			
	Routine Information Seeking	69			
	Time Spent on Article	69			