The Human Fact-Checker: Individual Characteristics That Lead to Different Interpretations of COVID-19 (Fake) News

Master Thesis

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Abstract

COVID-19 related fake news can affect people's adherence to public health guidelines and hinder governments' efforts to fight COVID-19. This highlights the importance of understanding why some people are better than others at distinguishing correctly between real and fake news. This study examined to what extent cognitive capacity, risk perception (regarding both COVID-19 and the vaccine), and institutional trust predicted the ability to distinguish correctly between real and fake news. Moreover, it was examined whether systematic processing played a mediating role between the relationships of these variables. This was investigated through a non-probability sampling method in which an online questionnaire was distributed in the Netherlands. Respondents (N = 235) had to indicate if presented news items were perceived as real, fake, or whether it was unknown, and to what extent they agreed with statements to measure the individual characteristics. The results showed that systematic processing, risk perception regarding COVID-19, and institutional trust were significantly and positively correlated with the ability to distinguish correctly between real and fake news. Risk perception regarding the vaccine was significantly and negatively correlated with the ability to distinguish correctly between real and fake news. Cognitive capacity was not significantly correlated with the ability to distinguish correctly between real and fake news. In addition, systematic processing marginally significantly mediated the relationship between risk perception regarding COVID-19 and the ability to distinguish correctly between real and fake news. Based on the findings, this study provided new information concerning the individual characteristics that make people less susceptible to fake news. Therefore, this study can be used as a baseline for future studies. Furthermore, interventions can be designed to minimise the negative effects of fake news by targeting the most susceptible individuals.

Keywords: COVID-19, fake news, cognitive capacity, risk perception, institutional trust

The emergence of COVID-19 led to a vast amount of fake news globally (Kouzy et al., 2020). An estimated 63% of the American population and 46% of the British population encountered COVID-19-related fake news (Pew Research Center, 2020a), with 66% encountering such news daily (Ofcom, 2020). Regarding COVID-19, fake news sources mostly distribute false information about the magnitude of the risks of the vaccine, details about the virus and vaccines, and ways to cope with the virus (Pew Research Center, 2020b). These messages can create false hope for protection. For example, people were told that smoking cigarettes and drinking alcohol kills COVID-19 (World Health Organization, 2020), that COVID-19 is not a serious threat, or that diets and vitamins can reduce the effects of COVID-19 (Cohut, 2020).

Another problem is that fake news causes confusion and mistrust in society and reduces people's trust in institutions (Tandoc, 2019; Uscinski et al., 2020). The result is that fewer people are inclined to trust experts' recommendations. Overall, fake news can affect people's adherence to public health guidelines and hinder governments' efforts to fight COVID-19. This influences general health through vaccine hesitancy, resulting in unnecessary deaths (Bangani, 2021).

The negative effects of fake news highlight the need to understand why some people are susceptible to fake news. In the literature, susceptibility to fake news is defined in two ways. First, it can be conceptualised as the overall belief in a fake news article. Hereby, the aspects that influence this belief do not affect people's ability to discern falsehood from the truth. In the second definition, susceptibility to fake news is defined as being unable to distinguish correctly between real and fake news (Pennycook & Rand, 2021; Roozenbeek et al., 2020). The latter definition is used in this study.

The literature identifies several individual characteristics that predict a person's susceptibility to fake news. Pennycook and Rand (2019a, 2021) found that an individual's processing style determines their ability to distinguish correctly between real and fake news. "Systematic processors" are more analytic and critical than "heuristic processors" and are therefore better able to distinguish correctly between real and fake news. Roozenbeek et al. (2020) showed that cognitive capacity correlates positively with reasoning skills and that good cognitive capacity leads to the ability to distinguish correctly between real and fake news. Douglas et al. (2017) found that people with high risk perceptions are inclined to rely on fake news to resolve their anxiety. Linden et al. (2020) and Freeman et al. (2020) found that institutional trust influences people's susceptibility to fake news. People with high institutional trust are less motivated to analyse news articles. Therefore, they use simplistic

decision rules, which means that they may believe fake news and be influenced by it.

This study addresses several research gaps and thus makes a novel contribution. First, it is known that a person's processing style, cognitive capacity, risk perception, and institutional trust are predictors of their susceptibility to fake news. However, there are no studies in which these predictors are integrated into a single model. Second, no studies have examined the indirect effects of cognitive capacity, risk perception, and institutional trust, via the person's processing style, on their susceptibility to fake news. The current research integrates the main predictors of a person's susceptibility to fake news into a single model, whereby the indirect effects of the processing style are assessed. This integration contributes to the relevance of this study, as it increases the understanding of why people are susceptible to fake news. This can help risk communicators to design effective interventions and reduce the negative effects of fake news.

Third, research is limited in the field of risks such as COVID-19 combined with the characteristics of why people are susceptible to fake news. Most research in the field of fake news has focused on political topics, such as the 2016 U.S. election, BREXIT, climate change, and immigration. To measure people's susceptibility to fake news, these studies used statements and headlines whereby respondents had to indicate whether the items were real news or fake news. Researchers have seldom evaluated susceptibility to fake news by assessing whole news articles, even though this is a common way to encounter fake news. In addition, the articles provided are often not researched systematically by the researchers. For example, the tested items contained different topics, which meant that democrats reacted differently to the content compared to republicans, or the fears aroused differed. The current study assesses the individual characteristics that predict the ability to distinguish correctly between real and fake news related to COVID-19, using a systematic and comprehensive research approach that contributes to the relevance of this study.

Lastly, no research has been conducted on the Dutch population to examine the individual characteristics that influence people's susceptibility to fake news. Most research about fake news has been conducted in other countries or continents, such as Pennycook and Rand's (2019a, 2021) study in the U.S., Ahinkorah et al.'s study in Africa (2020), and Kim and Kim's (2020) study in Korea. These regions have cultural, governmental, and legal differences that influence individual characteristics and how people respond to fake news (Hofstede, 2011; Rampersad & Althiyabi, 2019). Understanding the individual characteristics of the Dutch population that are linked to people's ability to distinguish between real and fake news has scientific value.

The following research question was formulated: Which individual characteristics influence whether a person can distinguish correctly between real and fake news related to COVID-19?

Theoretical Framework

Definitions of Fake News, Misinformation, and Disinformation

Fake news is commonly described as an intentional form of fabricated content that is distributed to mislead readers. Mistakenly distributing incorrect information and satirical formats are excluded from this definition. The definition of fake news adopted in this paper is "entirely fabricated and often partisan content that is presented as factual" (Pennycook et al., 2018, p. 1866). Misinformation can be defined as inaccurate information that is distributed unintentionally and without manipulative intent, which means it is not comparable with fake news (Greenspan & Loftus, 2020; United Nations Educational Scientific and Cultural Organization [UNESCO], 2018). Disinformation, however, can be labelled as false information which is distributed deliberately (Greenspan & Loftus, 2020; UNESCO, 2018). Therefore, disinformation and fake news are both characterised by an intentional effort to spread inaccurate information. These terms can be used interchangeably, but in this study, disinformation is denoted as fake news.

The Characteristics of Fake News Messages

Fake news messages have specific characteristics that make it difficult to discern fake news from real news. These include familiarity, perceived source credibility, and the ability to evoke emotions.

Familiarity is a form of repetition that facilitates fluent and rapid processing. It is found that people who are exposed once to a fake news headline are afterwards relatively likely to believe comparable headlines. This principle holds when the headline is implausible and disputed by fact-checkers and is inconsistent with the person's beliefs and political ideology, and the person forgets about having seen the information before (Pennycook & Rand, 2019b; Pennycook et al., 2018). An example of increasing familiarity is by displaying images in articles. This tactic causes people to use simple cues and process information less critically (Strange et al., 2011; Smelter & Calvillo 2020). The effect mainly occurs when people have a highly intuitive style of thinking. Sceptical people are less vulnerable (Dechêne et al., 2009). The familiarity characteristic is often used by fake news sources to mimic the

content of factual news and other fake news sources, as repeated information is often perceived as true (Pennycook & Rand, 2018, 2021; Dechêne et al., 2009; Smelter & Calvillo, 2020). Fake news is therefore difficult to distinguish from real news (Pennycook et al., 2018).

The perceived credibility of a source can be defined as "an individual's judgement of the veracity of the content of communication" (Appelman & Sundar, 2015, p. 63). This is the second characteristic of fake news. People are inclined to believe information that is provided by credible sources (Pornpitakpan, 2004; Dechêne et al., 2009). The perceived credibility of a source creates multiple biases, causing people to process information less critically (Metzger & Flanagin, 2013). This accounts for sources and social feedback such as "likes" (Pennycook & Rand, 2021; Avram et al., 2020; Luo et al., 2020). Fake news sources select and imitate trustworthy figures and organisations. As a result, audiences do not scrutinise the evidence and have a less sceptical focus (Ali & Zain-ul-Abdin, 2020). This makes it difficult to distinguish real news from fake news.

The third characteristic is that fake news sources create emotionally evocative messages. Fake news messages are intended to evoke strong and negative emotions, usually about threatening events (Freeman et al., 2020). These messages are novel and inspire fear and disgust about situations, whereas real messages generally inspire sadness, joy, and trust (Vosoughi et al., 2018). Because fake news provokes feelings of fear and anger (Pennycook & Rand, 2021), it stimulates discussions about social issues that lead to social discourse. Eventually, fake news leads to rumours and distrust, and enhances social conflict. Therefore, it becomes hard for people to identify reliable sources and information. Fake news also creates a feeling of inability to meet demands, as well as anxiety, emotional fatigue, and overwhelm. This increases the frequency of rumours (Kim & Kim, 2020). The presence of an emotionally evocative message means that people experience strong emotions, which increases the amount of fake news, and the belief in false news (Pennycook & Rand, 2021).

Information Processing Style and Susceptibility to Fake News

A person's information processing style can be defined as the way in which they use and analyse information to make judgements and decisions (Soane et al., 2015). The style can be based on heuristic processing or systematic processing. Heuristic processing employs simplistic decision rules to make judgements about the validity of a message; the person uses cues to easily arrive at judgements via non-content characteristics (Trumbo, 2002). By contrast, systematic processing is effortful; the person scrutinises contradictory elements among information when encountering information of personal importance (Trumbo, 2002).

Hence, systematic processors relate new information to already held information and attempt to understand all information via careful attention, deep thinking, and intensive reasoning (Chaiken & Ledgerwood, 2012). Tandoc et al. (2021) stated that researchers such as Pennycook and Rand (2019b) equated systematic processing with an effortful and analytic way of thinking. This equivalence between systematic processing and analytical thinking is also assumed in this study, since both require careful attention, deep thinking, and intensive reasoning.

Heuristic processing is more often relied on than is systematic processing. The reason is a lack of cognitive and motivational determinants (Griffin et al., 1999; Chaiken & Maheswaran, 1994). The cognitive determinant refers to the individual's information processing ability. Systematic processing is cognitively demanding. Hence, systematic processing can be constrained or disrupted by factors–whether individual or situational–that reduce a person's ability for detailed processing (Griffin et al., 1999). Heuristic processing is less cognitively demanding. Factors such as low prior knowledge and little time availability mean that heuristic processing can become particularly influential because it operates when systematic effort is challenging (Griffin et al., 1999). The motivational determinant is affected by the desire to form opinions about relevant facts. People often feel uncomfortable when they perceive that their knowledge is insufficient. People with the desire to form opinions are motivated to process information systematically (Griffin et al., 1999).

Systematic processing causes people to critically assess content, such that the content is judged on the plausibility of the information. By contrast, heuristic processing is intuitive and unstable, and it may arise from unstable behaviour. Heuristic processing thus causes people to be non-reflective and biased (Ali & Zain-ul-Abdin, 2020; Trumbo, 2002). Hence, heuristic processors are relatively poor at distinguishing correctly between real and fake news (Pennycook & Rand, 2019b, 2021) and are often likely to believe fake news (Bronstein et al., 2018).

The above definitions indicate that heuristic processing and systematic processing are two opposing sides of information processing. This distinction is also reflected in the way the processing style has been operationalised by researchers. For example, Smerecnik et al. (2011, p. 60) measured heuristic processing through statements such as "I did not spend much time thinking about the information". The word "not" indicates that the statement is the opposite of systematic processing. The same point is evident in the survey by Griffin et al. (2008). Other literature operationalises only one processing style, with heuristic and systematic processing being considered equivalent (Kruglanski & Thompson, 1999;

Kruglanski et al., 2006). The latter approach does not correspond with the heuristic-systematic model of information processing, in which individuals use one or both types of information processing styles when evaluating information to arrive at a judgement (Trumbo, 2002).

Overall, the perspective in which heuristic processing and systematic processing are viewed as opposites is supported and operationalised in several studies. By contrast, the idea that heuristic processing and systematic processing occur simultaneously has not effectively been operationalised. The first perspective is therefore assumed in this study. Furthermore, because heuristic processing can only be measured indirectly, it is complex and unreliable to operationalise (Bellur & Sundar, 2014). Systematic processing is easier to measure. In view of the optimal measurement style, in this study, the degree of systematic processing is used to indicate the person's overall processing style. People who process information using few systematic approaches are assumed to process mainly heuristically, and vice versa.

Hence, the following hypothesis was formulated (see Figure 1):

There is a positive correlation between systematic processing and the ability to distinguish correctly between real and fake news (H1).

Cognitive Capacity and Susceptibility to Fake News

Cognitive capacity can be defined as "a general mental capability involving reasoning, problem-solving, planning, abstract thinking, complex idea comprehension, and learning from experience" (Gottfredson, 1997, as cited in Ispas & Borman, 2015, p. 937).

Cognitive capacity is negatively associated with the susceptibility to fake news. Several studies (Zhu et al., 2010; Greene & Murphy, 2020) found that people with lower cognitive capacity remembered the details of news articles less clearly than people with high cognitive capacity, and the former group confused true memories with false memories. Consequently, they were relatively likely to believe fake news.

Cognitive capacity can be distinguished into fluid intelligence and crystallised intelligence. Fluid intelligence consists of deductive and inductive reasoning. Crystallised intelligence consists of an individual's acquired declarative knowledge, which contains lexical, cultural, and general information. High levels of both types of intelligence correlate with the ability to distinguish correctly between real and fake news (Sindermann et al., 2021). Specifically, people with high levels of education (van Prooijen, 2016), analytical thinking (Pennycook et al., 2019a, 2019b), and numerical ability (Kahan et al., 2017; Roozenbeek et al., 2020) were found to have good reasoning skills and be less susceptible to fake news. Crystallised intelligence also reflects the extent to which a person has–partly through their

fluid intelligence–learned from exposure to their culture, such as education and life experience (Carroll, 1993). People who score high on both types of intelligence are likely to have knowledge about various subjects.

Knowledgeable people about COVID-19 are, due to their rationality, unlikely to believe COVID-19 related fake news (Greene & Murphy, 2020; Gupta et al., 2022). Thus, cognitive capacity is assumed to correlate positively with the ability to distinguish correctly between real and fake news. The following hypothesis was thus formulated (see Figure 1):

> There is a positive correlation between cognitive capacity and the ability to distinguish correctly between real and fake news (H2a).

Moreover, cognitive capacity influences how individuals process information, and this determines people's susceptibility to fake news. People with low cognitive capacity are less equipped to change their existing schemes and initial judgements when confronted with new and more reliable information. Therefore, people with low cognitive capacity often are unable to distinguish correctly between real and fake news, even after the explicit disconfirmation of the false information (Keersmaecker & Roets, 2017). Also, systematic processing is cognitively demanding. Therefore, systematic processing reduces, making it for people more difficult to distinguish correctly between real and fake news (Trumbo, 2002; Bronstein et al., 2018; Pennycook & Rand 2019a, 2019b; Lang, 2000; Wang et al., 2022; Griffin et al., 1999; Roozenbeek et al., 2020). Thus, cognitive capacity is assumed to correlate positively with systematic processing. Furthermore, cognitive capacity is assumed to indirectly–through systematic processing–influence the ability to distinguish correctly between real and fake news. Hence, the following hypotheses were formulated (see Figure 1):

> There is a positive correlation between cognitive capacity and systematic processing when analysing news articles (H2b).
>
> Systematic processing mediates the relationship between cognitive capacity and the ability to distinguish correctly between real and fake news (H2c).

Risk Perception and Susceptibility to Fake News

Risk perception can be defined as "individuals' subjective judgements about the severity and likelihood of negative occurrences such as injury, disease, and death" (Paek & Hove, 2017, p. 1).

Risk perception is a predictor of a person's susceptibility to fake news. Perceptions of high risk stimulate rumours and discussions that distort social facts and evoke suspicion,

distrust, and social conflict. As a result, more false information becomes available (DiFonzo & Bordia, 2007; Kim & Kim, 2020). People who often hear rumours that are distributed by fake news sources often rely on such information because of the familiarity characteristic (Pennycook & Rand, 2021). Hence, people with high risk perceptions encounter plentiful fake news due to rumours and so on; therefore, it becomes even harder for them to distinguish correctly between real and fake news.

Overall, risk perception is assumed to correlate negatively with the ability to distinguish correctly between real and fake news. Hence, the following hypothesis was formulated (see Figure 1):

> There is a negative correlation between risk perception and the ability to distinguish correctly between real and fake news (H3a).

Another reason why people with high risk perceptions are susceptible to fake news is their limited use of systematic processing. Anxiety impairs one's attentional control and reduces one's focus (Eysenck et al., 2007) and is associated with poor cognitive performance (Sarason, 1988, as cited in Eysenck et al., 2007) and limited systematic processing (Weeks, 2015; Grzesiak-Feldman, 2013; Martel et al., 2020). The main cause of poor cognitive performance is that the person focuses on the stressful subject. Hence, they analyse information in a way that is in line with their preconceptions, and they fall for biases (Swire et al., 2017; Reedy et al., 2014). In addition, when threatened, people are motivated to compensate for the threatening situation and may turn to fake news to resolve their anxiety. Although fake news creates strong negative emotions about situations, it can also reduce uncertainty and increase one's perceived control by providing coping mechanisms (Douglas et al., 2017; Freeman et al., 2020).

This process corresponds with the theory of motivated reasoning. This theory proposes that judgements about believing information are driven by two motivations. The first is the accuracy goal (the need to find correct information), and the second is the predominant directional goal (the need to find information that is consistent with the desired outcome; Kunda, 1990). Fake news sources exploit threatening events because vulnerable people do not process the news systematically and are inclined to accept the messages (Freeman et al., 2020).

The risk information seeking and processing (RISP) model by Griffin et al. (1999) explains how risk perceptions can lead to systematic processing. This model states that background variables determine the risk perception. When risk perception is high, the need

for information increases. The information need is an insufficiency threshold which arises through the gap between current knowledge and the full knowledge the individual needs to make decisions. When a person perceives information insufficiency and is influenced by the risk, the information is searched systematically. This means that people spend more effort–beyond their routine information channels–to find information sources which can be more deeply processed. People with high risk perceptions are relatively likely to experience information insufficiency and thus search for information in non-routine ways, and process information systematically (Griffin et al., 1999; Kahlor et al., 2003).

However, most people cannot process all the information systematically due to cognitive overload (Speier et al., 1999). Therefore, people with high risk perceptions end up processing less systematically because of this cognitive overload; instead, they adopt biases and rely on information that corresponds with their existing ideas. In conclusion, risk perception is assumed to negatively correlate with systematic processing. Furthermore, risk perception is assumed to indirectly-through systematic processing–influence the ability to distinguish correctly between real and fake news. Hence, the following hypotheses were formulated (see Figure 1):

> There is a negative correlation between risk perception and systematic processing when analysing news articles (H3b).
>
> Systematic processing mediates the relationship between risk perception and the ability to distinguish correctly between real and fake news (H3c).

Institutional Trust and Susceptibility to Fake News

Trust has several definitions, which differ across disciplines and studies. Confidence and similar values are constructs that are commonly ascribed to trust (Heidarabadi et al., 2011; Dietz & den Hartog, 2006). This is in line with Siegrist et al.'s (2003, p. 706) definition of trust, which is used in this paper, namely "the willingness to make oneself vulnerable to another person or entity based on a judgement of similarity of intentions or values".

Several studies have found that a person's tendency to believe fake news is reduced by trust in science (Plohl & Musil, 2020; Roozenbeek et al., 2020), trust in media and journalism (Linden et al., 2020), interpersonal trust (Leman & Cinnirella, 2013; Abalakina-Paap et al., 1999), and trust in the government (Freeman et al., 2020; Einstein & Glick, 2014). "Institutional trust" in this study refers to the trust that people placed in organisations involved in the COVID-19 crisis, such as the Dutch government, risk communicators, and vaccine manufacturers. When people have a strong trust in institutions, they are likely to

believe and rely on official information (Linden et al., 2020; Freeman et al., 2020; Uscinski et al., 2020; Vinck et al., 2019). Therefore, people experience information sufficiency and are relatively unlikely to encounter and believe fake news. In contrast, people with weak institutional trust often follow non-mainstream media, which increases their likelihood of encountering and believing fake news (Tsfati & Peri, 2006).

However, when people with high institutional trust encounter fake news, they may also be susceptible to it. Yamagishi et al. (2015) and Rothstein (2005, as cited in Jagers et al., 2021) found that people who believe they cannot trust institutions–for example because of corruption–also are less likely to trust other sources. By contrast, people with high levels of institutional trust are more likely to trust any sources (Spadaro et al., 2020; Yamagishi et al., 2015; Rothstein, 2005, as cited in Jagers et al., 2021; Kim, 2014). Therefore, people with high institutional trust may trust fake news sources and be unable to correctly distinguish between real and fake news. In such a case, institutional trust would be inversely related to the ability to distinguish correctly between real and fake news. To test this possibility, the following hypothesis was formulated (see Figure 1):

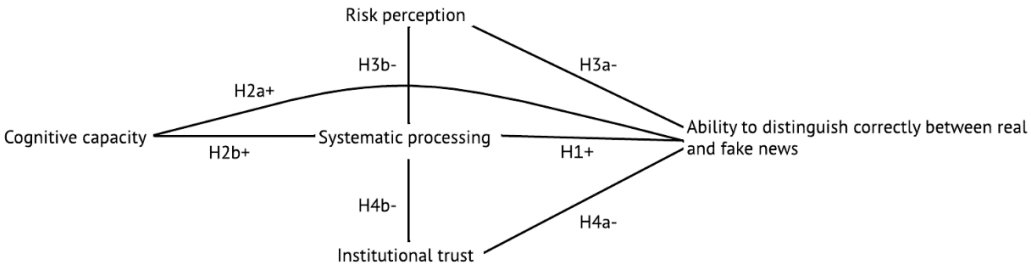
> There is a negative correlation between institutional trust and the ability to distinguish correctly between real and fake news (H4a).

Another reason why people with strong institutional trust are susceptible to fake news is their tendency not to use systematic processing. Studies found that people with high institutional trust process unsystematically, as high trust in institutions reduces the idea that systematic processing is necessary (Trumbo & McComas, 2003, 2008; Wong & Jensen, 2020; Roozenbeek et al., 2020). This reasoning corresponds with the RISP model and was supported by a study by Tortosa-Edo et al. (2013), who found that high trust led to low motivation to employ systematic processing. In conclusion, institutional trust can be assumed to correlate negatively with systematic processing. In addition, institutional trust is assumed to indirectly–through systematic processing–influence the ability to distinguish correctly between real and fake news. Hence, the following hypotheses were formulated (see Figure 1):

> There is a negative correlation between institutional trust and systematic processing when analysing news articles (H4b).
>
> Systematic processing mediates the relationship between institutional trust and the ability to distinguish correctly between real and fake news (H4c).

Figure 1

Conceptual Model of the Hypothesised Correlations Between the Variables



Note. The relationships of cognitive capacity (H2c), risk perception (H3c), and institutional trust (H4c) on the ability to distinguish correctly between real and fake news were expected to be mediated through systematic processing.

Current Study

This study aims to provide insight about the individual characteristics that influence whether individuals can distinguish correctly between real and fake news related to COVID-19. This was a quantitative cross-sectional study in which a self-administered questionnaire was presented to participants of Dutch nationality. The objective was to measure their ability to distinguish correctly between real and fake news and assess its presumed determinants: systematic processing, cognitive capacity, risk perception, and institutional trust.

Participants received COVID-19-related articles containing fake news and real news. The task was to read all the articles and indicate whether each one was real, fake, or unknown. Thereafter, it was analysed whether the independent variables correlated with the dependent variable “the ability to distinguish correctly between real and fake news”. Moreover, it was analysed whether systematic processing mediated the relationship between the independent variables and the dependent variable.

Methodology

Participants

The data was obtained from 403 respondents who were approached through a snowball (non-probability) method. Specifically, the participants were approached through the personal network of the Dutch researcher, and the survey was promoted through Facebook and LinkedIn. Respondents had to meet the following requirements: (a) aged at least sixteen, (b) the respondent provided their informed consent, and (c) the respondent answered all the questions. The sample represented the overall Dutch population.

After the exclusion method, 168 participants were removed from the data set, leaving

235 participants. Among them, 68 were male (29%) and 167 were female (71%). Their ages ranged from 17 to 87 years, with a mean age of 31 years (*SD* = 13.7). The highest educational level of most (55%) respondents was a higher vocational education or scientific education, with the remaining 45% having a secondary vocational education or less. Forty-eight per cent of the participants had not been infected with COVID-19; 32% had been infected, and 20% did not know. Finally, 14% of the respondents had been vaccinated with three jabs; 60% had two jabs and 26% had either one jab or no vaccination.

Materials

Questionnaire

The self-administered questionnaire was distributed in December 2021 through an online link that guided respondents to the software platform Qualtrics (see Appendix A). This platform was accessible through tablets, smartphones, and computers. The questionnaire first asked about demographic characteristics. Subsequently, five fake news and two real news items were displayed. The aim was to test whether respondents were able to distinguish correctly between real and fake news. The questionnaire then presented four tests to measure the independent variables. Some of the answers were reverse scored to avoid acquiescence tendency and other biases.

News Articles

The presented news items contained topics related to COVID-19 and the vaccine. The messages were displayed in two formats, namely Twitter account messages and news articles. The real news items were gathered from official sources and were fact-checked by the researcher. The fake news items were found via the official fact-checking site called AFP, where debunked fake news messages and sources were available. The real and fake news items were modified to make the articles relatively similar, through creating equal numbers of words; adding social feedback such as likes, comments, and shares; and by changing profile names to fictional characters. The fake news characteristics of familiarity, perceived source credibility, and being emotionally evocative were present in all items. Appendix B shows a schematic overview of the similarities and differences between the fake and true news items.

Instruments

The Ability to Distinguish Correctly Between Real and Fake News

To measure the ability to distinguish correctly between real and fake news, the questionnaire presented respondents with two real news items and five fake ones to read. Below each item, the respondent had to comment whether they perceived it as real, fake, or unknown. The latter category was added to prevent guessing. The overall score for the ability to distinguish correctly between real and fake news was calculated by adding the number of correct responses. The answer "I do not know" was considered an error. An open question was also presented, which stated, "Which aspects made you believe that some articles were fake news while the other articles were real news?" This helped to increase the reliability, as it was possible to filter out answers such as "I looked it up online".

Systematic Processing

Systematic processing was measured by six items, adapted from Griffin et al. (2008) and Smerecnik et al. (2011) (see Appendix C). Griffin et al. measured systematic processing through four statements and Smerecnik et al. used five statements. This study used a subset of the items that showed the highest factor loadings. These items were modified into COVID-19 related statements. The items presented statements about how the respondent processed and analysed fake and real news articles. The items were answered on a five-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*).

Exploratory factor analysis (EFA) was conducted to analyse the factor structure of the six items using principal axis factoring (PAF) with orthogonal (varimax) rotation. Item 1 "When I come across information on COVID-19, I only focus on a few key points." had a factor loading below .40 and was deleted. Item 5 "More information is offered on COVID-19 than I personally need." negatively affected the Cronbach alpha. Moreover, it had a factor loading below .40 on the factor "systematic processing". Therefore, item 5 was deleted. This increased the Cronbach alpha score from .53 to .72.

After excluding item 1 and item 5, the Kaiser-Meyer-Olkin (KMO) test yielded a result of .75, which was above the threshold of .50. The result on the Barlett test of sphericity was sufficient, X^2 (6) = 175.74, $p < .001$. Both tests indicated that the items were suitable for factor analysis. The scree plot and number of factors with eigenvalues above 1 showed one factor explaining 54.7% of the variance in the data with an eigenvalue of 2.19. The items indicated that the factor was related to the theoretical construct of systematic processing and represented it well. The systematic processing scale had high reliability, with a Cronbach alpha of .72 (see Table 1). The overall score for systematic processing was calculated by adding the four item scores and dividing the result by the number of items.

Table 1

Results From an Exploratory Factor Analysis of the Systematic Processing Items

Item	Factor loading	Communality	α
Factor: systematic processing			.72
3. When I come across information on COVID-19, I will think about it so that I can consider actions to protect myself and my family.	**.77**	.59	
4. When I must protect myself and my family from COVID-19, I want to take in many viewpoints.	**.61**	.38	
2. I make connections between newly obtained COVID-19 information, and COVID-19 information obtained elsewhere.	**.59**	.34	
6. When I come across information on COVID-19, I read and/or listen as much as I can to absorb the information, even if I disagree with the point of view.	**.55**	.31	

Note. N = 235. The original items were in Dutch. The extraction method was PAF with an orthogonal (varimax) rotation. Factor loadings > .40 are in bold.

Cognitive Capacity

Cognitive capacity was measured using two constructs: crystallised intelligence and fluid intelligence. Crystallised intelligence consists of a person's acquired declarative knowledge, which includes lexical, cultural, and general information (Sindermann et al., 2021). It thus involves the ability to use earlier acquired knowledge from education and experience, such as skills, procedures, and facts. Lexical knowledge can be measured as vocabulary knowledge and reading comprehension (Baghaei & Tabatabaee, 2015). Therefore, emphasis is placed on reading, writing, spelling, and listening skills to measure crystallised intelligence.

Fluid intelligence reflects basic reasoning abilities and higher mental processes (Carroll, 1993). It consists of inductive and sequential reasoning skills. Thus, reasoning ability and higher mental processes–such as solving and analysing novel problems, pattern recognition, abstract thinking, and logic–are central to the measurement of fluid intelligence (Baghaei & Tabatabaee, 2015; Sindermann et al., 2021).

Cognitive capacity was measured by nine items. Five of them measured crystallised intelligence and the other four measured fluid intelligence (see Appendix C). The respondent's self-perceived knowledge was used as a proxy to measure both crystallised and fluid intelligence. The statements were answerable via a five-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). Before the items were displayed in the questionnaire, it was

stated that the general Dutch population should be used as a reference point when answering the statements. Then, a control statement was presented to assess the respondent's self-perceived knowledge about COVID-19. The same Likert scale was used.

An EFA was conducted to analyse the factor structure of the nine items using PAF with oblique (direct oblimin) rotation. Item 7 "I would describe my general knowledge as good." had a factor loading below .40 and a cross-loading of less than .20 and was therefore deleted. Thereafter, item 12 "I am good at creative (out of the box) thinking to solve new problems." also had a factor loading of less than .40 and a cross-loading below .20 and was thus deleted.

After these exclusions, the KMO measure was .83, which is above the threshold of .50. The result on the Barlett test of sphericity was sufficient, $X^2\,(21) = 347.44$, $p < .001$. Both tests indicated that the items were suitable for factor analysis. The scree plot and the number of factors with an eigenvalue above 1 showed one factor explaining 42.3% of the variance in the data with an eigenvalue of 2.96. This finding meant that the two theoretical constructs were not distinguished by participants, and only one factor was relevant. The seven items suggested that the factor represented the person's overall cognitive capacity. The cognitive capacity scale had high reliability, with a Cronbach's alpha of .76 (see Table 2). The cognitive capacity score was calculated by adding the seven item scores and dividing the result by the number of items.

Table 2

Results From an Exploratory Factor Analysis of the Cognitive Capacity Items

Item	Factor loading	Communality	α
Factor: cognitive capacity			.76
9. When I read informative pieces of text, I usually understand exactly what is meant by it.	**.79**	.62	
8. When someone tells a complex story, I usually understand exactly what is meant by it.	**.70**	.49	
14. I am good at memorising new information.	**.55**	.30	
11. When writing, I can express myself grammatically correctly.	**.53**	.28	
13. I am good at solving brain teasers.	**.49**	.24	
10. I am good at articulating my arguments during discussions.	**.48**	.23	
15. I am good at recognising patterns.	**.43**	.19	

Note. $N = 235$. The original items were in Dutch. The extraction method was PAF with an oblique (direct oblimin) rotation. Factor loadings > .40 are in bold.

Risk Perception Regarding COVID-19

Risk perception was measured by two constructs: perceived likelihood and severity. Likelihood refers to "how likely it is that a negative event will occur if no mediating behaviour is performed", while severity can be defined as "how bad the outcome of a negative event will be if no preventive or mitigating behaviour is undertaken" (Notebaert et al, 2016, p. 986). This study measured risk perception regarding COVID-19 and the vaccine. Since the risks regarding COVID-19 and the vaccine differ in terms of severity and likelihood, it was decided to separate them into two variables.

To measure risk perception regarding COVID-19, this study drew on the questionnaires by Wise et al. (2020) and Dryhurst et al. (2020). The items in those questionnaires were transformed into four statements. Two statements were about the likelihood of contracting COVID-19 and two were about the severity of COVID-19 (see Appendix C). The items were answerable on a five-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*).

The four items were analysed using PAF with oblique (direct oblimin) rotation. The KMO measure was above the threshold of .50, namely .55. The Barlett test of sphericity was sufficient, X^2 (6) = 168.23, $p < .001$. Both tests indicated that the items were suitable for factor analysis. The scree plot and the number of factors with an eigenvalue above 1 showed two factors explaining 76.2% of the variance in the data. Factor 1 explained 47.5% of the variance with an eigenvalue of 1.90. Factor 2 explained 28.7% of the variance with an eigenvalue of 1.15. The items that correlated with these two factors indicated that Factor 1 represented the severity of COVID-19. Factor 2 represented the likelihood of contracting COVID-19. This finding corresponded with the theoretical constructs. The severity subscale had sufficient reliability, with a Cronbach's alpha of .71 (see Table 3). The likelihood subscale also had sufficient reliability, with a Cronbach's alpha of .64. However, both factors consisted of only two items each, so the researcher decided to combine them under an overarching variable. The two constructs complemented each other and helped to explain people's risk perception regarding COVID-19. The overall score for risk perception about COVID-19 was calculated by adding the four item scores and dividing the result by the number of items. The combined Cronbach's alpha score for the four items was .63.

Before the risk perception items were displayed to the participant, two control questions were asked. They were "Are you currently, or have you in the past, been infected with COVID-19?" and "Are you vaccinated against COVID-19?" Both questions had five

possible answers: the participant (a) had been infected; was fully vaccinated; (b) was not infected; was not vaccinated; and response (c) that fit in between the other responses.

Table 3

Results From an Exploratory Factor Analysis of the Risk Perception Regarding COVID-19 Items

Item	Factor loading		Communality	α
	1	2		
Factor 1: severity of COVID-19				.71
19. The COVID-19 virus can cause major negative effects on the health of "average Dutch" individuals.	**.82**	-.06	.64	
18. The COVID-19 virus can cause major negative effects on my health.	**.67**	.08	.50	
Factor 2: likelihood of contracting COVID-19				.64
16. There's a high probability that I will contract the COVID-19 virus (again).	-.06	**.79**	.60	
17. There's a high probability that "average Dutch" individuals will contract the COVID-19 virus (again).	.07	**.61**	.40	

Note. $N = 235$. The original items were in Dutch. The extraction method was PAF with an oblique (direct oblimin) rotation. Factor loadings > .40 are in bold.

Risk Perception Regarding the COVID-19 Vaccine

Risk perception regarding the COVID-19 vaccine was measured using the same constructs as risk perception regarding COVID-19, namely perceived likelihood, and severity. Again, the questionnaires by Wise et al. (2020) and Dryhurst et al. (2020) were consulted to formulate four statements. Two statements were about the likelihood of the COVID-19 vaccine having adverse effects, and two statements were about the side effects of the vaccines (see Appendix C). These statements were answerable on a five-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*).

The four items on risk perception regarding the COVID-19 vaccine were analysed using PAF with orthogonal (varimax) rotation. The KMO measure was above the threshold of .50, namely .76. The Barlett test of sphericity was sufficient, $X^2(6) = 921.41$, $p < .001$. Both test results indicated that the items were suitable for factor analysis. The scree plot and the number of factors with an eigenvalue above 1 showed one factor explaining 85.5% of the variance in the data with an eigenvalue of 3.42. Thus, the two theoretical constructs could not be distinguished by the participants, and only one factor was used. The items that correlated

with this single factor indicated that it represented the overall risk perception regarding the COVID-19 vaccine. The scale had sufficient reliability, with a Cronbach's alpha of .94 (see Table 4). The overall score for risk perception regarding the vaccine was calculated by adding the four items and dividing the result by the number of items.

Table 4

Results From an Exploratory Factor Analysis of the Risk Perception Regarding the COVID-19 Vaccine Items

Item	Factor loading	Communality	α
Factor: risk perception vaccine			.94
23. The COVID-19 vaccine can cause major negative effects on the health of "average Dutch" individuals.	**.92**	.84	
22. The COVID-19 vaccine can cause major negative effects on my health.	**.89**	.80	
21. There is a high probability that the COVID-19 vaccine will have negative effects on the health of "average Dutch" individuals.	**.89**	.80	
20. There is a high probability that the COVID-19 vaccine will have negative effects on my health.	**.89**	.79	

Note. $N = 235$. The original items were in Dutch. The extraction method was PAF with an orthogonal (varimax) rotation. Factor loadings > .40 are in bold.

Institutional Trust

Institutional trust was measured by two constructs, namely similarity of values and confidence. Confidence can be defined as "the belief, based on experience or evidence, that certain future events will occur as expected" (Siegrist et al., 2003, p. 706).

To measure institutional trust, this study drew on a questionnaire by Stokes (1962, as cited in Nicholls & Picou, 2012), in which five items measured benevolence towards governments. Similar to other papers, such as Bowler and Karp (2004), this study used the general approval of governments as a proxy measure for institutional trust. The items were adjusted into statements to measure people's perceptions about how much they believed that the governmental institutions were capable and willing to protect them from COVID-19. This approach addressed a criticism of other research, namely that when answering the questions, some participants would think about short-term events while others would think of events that happened a long time ago. The items were supplemented with another relevant item that focused on how institutions had managed previous pandemics. One item (namely "Do you think that institutional personnel are a little corrupt?") was removed. This item was similar to

an item that tapped to what extent institutional people were perceived to act out of self-interest. The constructs were measured by four items. Two items measured confidence, and two measured similarity in values (see Appendix C). The items were answered on a five-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*).

An EFA was conducted to analyse the factor structure of the four items using PAF with orthogonal (varimax) rotation. The KMO measure was above the threshold of .50, namely .81. The Barlett test of sphericity was sufficient, X^2 (6) = 461.89, $p < .001$. Both tests indicated that the items were suitable for factor analysis. The scree plot and the number of factors with an eigenvalue above 1 showed one factor explaining 71.6% of the variance in the data with an eigenvalue of 2.87. This finding indicated that the two theoretical constructs were not distinguished by the participants, and therefore only one factor was used. The four items that correlated with the factor suggested that it represented overall institutional trust. The institutional trust subscale had high reliability, with a Cronbach's alpha of .87 (see Table 5). The overall score for institutional trust was calculated by adding the four items and dividing the score by the number of items.

Table 5

Results From an Exploratory Factor Analysis of the Institutional Trust Items

Item	Factor loading	Communality	α
Factor: institutional trust			.87
24. Dutch governmental institutions can be trusted to do what is right regarding COVID-19.	**.89**	.79	
26. Individuals who lead governmental agencies, and make key decisions concerning COVID-19, are competent.	**.83**	.69	
25. Governmental institutions are mainly run by a small group of individuals acting in their own interests. (R)	**.74**	.55	
27. Dutch governmental agencies have shown in the past that they can manage major crises, such as a virus outbreak, well.	**.69**	.48	

Note. N = 235. The original items were in Dutch. The extraction method was PAF with an orthogonal (varimax) rotation. Factor loadings > .40 are in bold. Reverse-scored items are denoted with an (R).

Demographics

At the beginning of the questionnaire, participants were asked to state their demographic information. The demographic variables included age (year of birth), gender,

level of education, whether the respondent had been infected with COVID-19, and whether they were vaccinated.

Procedure

The questionnaire was initially tested on a small sample before it was distributed to all respondents. The questionnaire was approved by the BMS Ethics Committee of the University of Twente. It contained contact information of the researcher and an introductory section consisting of general information (see Appendix A). In addition, an informed consent form was included. After accepting, respondents were asked to answer the demographic questions. Then, instructions were displayed on how to answer the rest of the questionnaire. The questionnaire was then displayed, and the questions could be answered. Finally, participants were thanked for their participation.

Data Analysis

For the data analysis, the Statistical Package for the Social Sciences (SPSS, version 27) was used with a plug-in called PROCESS (v4.0 by Andrew F. Hayes). First, the data were checked for incomplete responses, participants who did not provide their consent, and those who were under 16 years of age. These respondents were removed.

EFA with PAF was conducted to assess the dimensionality of the scales. An oblique (direct oblimin) rotation method was used for items with latent constructs that were correlated. An orthogonal (varimax) rotation method was used for items with insignificantly correlated latent constructs. Latent constructs with factor correlation matrix scores above .30 were perceived as significantly correlated (Field, 2018). The 40-30-20 rule was used as a minimum criterion for the items. This means that items had to meet the following assumptions: (a) items should load with a score above .40 on the primary factor, (b) lower than .30 on alternative factors, (c) whereby the difference between the primary and alternative factors is at least .20 (Howard, 2015). The internal consistency of the scales was assessed with Cronbach’s alpha scores.

Thereafter, descriptive statistics and Pearson correlations were calculated to examine the relationships among the variables. Age and gender were included as variables. To analyse the extent to which males and females differed in their responses, the researcher performed six independent-sample *t*-tests. Cohen's *d* scores were considered to examine the effect sizes.

The next step was investigating which variables predicted (a) the ability to distinguish correctly between real and fake news and (b) systematic processing. Two multiple linear

regression analyses were conducted. Before the analyses, the assumptions of linearity, homoscedasticity, normality, and multicollinearity were checked. The linearity assumption was analysed by a scatter plot, which showed linear relationships between the predictors and the outcome variables. Thus, linearity was assumed. The homoscedasticity assumption was assessed by scatterplots, and was confirmed, since no patterns were visible in the plots. The normality assumption was confirmed since the points in the Q-Q plots were on a straight diagonal line. Lastly, the multicollinearity assumption was met since none of the variance inflation factor scores was above 10.

The next analysis investigated whether systematic processing mediated the relationship between predictor variables and the ability to distinguish correctly between real and fake news. Multiple mediation analyses were conducted. These analyses assessed whether the direct effect of a predictor on the ability to distinguish correctly between real and fake news was significantly diminished when systematic processing was employed. The same assumptions applied to the mediation analyses, as for the regression analyses. The analyses were also conducted separately for males and females, and the two factors in risk perception regarding COVID-19, namely likelihood and severity.

Results

Descriptive Statistics and Correlations

Table 6 shows the means, standard deviations, and Pearson correlations for the ability to distinguish correctly between real and fake news, systematic processing, cognitive capacity, risk perception related to COVID-19, risk perception related to the vaccine, and institutional trust. The demographic variables age and gender are also included. The results showed that respondents were, on average, able to distinguish 4.26 of the 7 items correctly. Therefore, the ability to distinguish correctly between real and fake news was moderately high. The standard deviation of 1.85 indicates high variability in the ability to distinguish correctly between real and fake news items.

Table 7 shows the results of the respondents' provided answers to the news articles. A score of 0 indicated that the article was incorrectly distinguished while a score of 1 indicated that it was distinguished correctly. Article 1 (M = 0.49, SD = 0.50), article 4 (M = 0.56, SD = 0.50), article 5 (M = 0.58, SD = 0.50), and article 6 (M = 0.50, SD = 0.50) had approximately equal numbers of correct versus incorrect answers. Article 2 (M = 0.70, SD = .46), article 3 (M = 0.74, SD = 0.44), and article 7 (M = 0.69, SD = 0.47) were distinguished correctly more often than incorrectly.

Further, article 4 (by 22% of the respondents) and article 6 (by 24% of the respondents) were most often mistakenly interpreted as real news articles while being fake news. Article 1 (by 20% of the respondents) was most often interpreted as fake news while it was real news. In addition, all articles were often answered by respondents with "I do not know", ranging between 17% and 31%.

Most respondents reported that they considered themselves to have above average systematic processing capacities (M = 3.62, SD = 0.78). This variable and the following variables were measured on a 5-point Likert scale. Respondents reported that they perceived themselves as having a reasonably strong cognitive capacity (M = 3.97, SD = 0.56), since they scored well above the midpoint of the scale. The risk of COVID-19 was perceived to be above average (M = 3.39, SD = 0.78), whereas the risk of the vaccine was perceived to be below average (M = 2.79, SD = 1.11). However, both scores were close to the midpoint of the scale. Institutional trust was perceived as average (M = 2.88, SD = 0.61) by the respondents. The standard deviations indicated that the variability in the respondents' answers was rather small. Only the variable "risk perception regarding the vaccine" had a relatively high variability.

Table 6

Descriptive Statistics and Correlations of the Variables

Variable	*M*	*SD*	1	2	3	4	5	6	7	8
1. The ability to distinguish correctly between real and fake news [a]	4.26	1.85	-							
2. Systematic processing [b]	3.62	0.78	.13*	-						
3. Cognitive capacity [b]	3.97	0.56	.08	.37***	-					
4. Risk perception COVID-19 [b]	3.39	0.78	.14*	.14*	.01	-				
5. Risk perception vaccine [b]	2.79	1.11	-.49***	-.16**	-.04	-.20**	-			
6. Institutional trust [b]	2.88	0.61	.39***	.17**	.11*	.28***	-.51***	-		
7. Age	31.11	13.73	.05	.22***	.14*	.18**	-.07	.19**	-	
8. Gender [c]	1.71	0.45	-.15*	-.17**	-.10†	-.07	.25***	-.20**	-.10†	-

Note. N = 235.

[a] The variable was measured by the number of correct answers in distinguishing between real and fake news, ranging from 0 (no correct answers) to 7 (all correct answers).

[b] The variable was measured via a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

[c] 1 = males, 2 = females.

†p < .10 (one-tailed). *p < .05 (one-tailed). **p < .01 (one-tailed). ***p < .001 (one-tailed).

Table 7

Respondents' Provided Answers to the News Articles

Item	*M*	*SD*	Possible answer		
			Real news article	Fake news article	I do not know
1	0.49	0.50	**116 (49%)**	47(20%)	72 (31%)
2	0.70	0.46	31 (13%)	**164 (70%)**	40 (17%)
3	0.74	0.44	18 (8%)	**175 (74%)**	42 (18%)
4	0.56	0.50	51 (22%)	**131 (56%)**	53 (22%)
5	0.58	0.50	32 (14%)	**136 (58%)**	67 (28%)
6	0.50	0.50	56 (24%)	**117 (50%)**	62 (26%)
7	0.69	0.47	**161 (69%)**	26 (11%)	48 (20%)

Note. $N = 235$. Measured as 0 (incorrectly distinguished) and 1 (correctly distinguished). The correct answers are displayed in bold.

Independent *t*-tests

Independent *t*-tests were performed to assess whether the mean scores of the variables differed significantly between males and females. The main reason for this test was that females were overrepresented in the study. Table 8 shows the results with two-tailed significance scores. Overall, males had significantly higher scores ($M = 4.69$, $SD = 1.88$) for the ability to distinguish correctly between real and fake news, compared to females ($M = 4.08$, $SD = 1.81$), $t(233) = 2.33$, $p = .021$, $d = 0.34$. Males ($M = 3.83$, $SD = 0.70$) scored also significantly higher than females ($M = 3.54$, $SD = 0.80$) regarding systematic processing, $t(233) = 2.63$, $p = .009$, $d = 0.38$. The gender differences for cognitive capacity were not significant, $t(233) = 1.53$, $p = .127$, $d = 0.22$.

Males had significantly lower risk perceptions regarding the vaccine ($M = 2.35$, $SD = 1.02$) than females ($M = 2.97$, $SD = 1.10$), $t(233) = -3.99$, $p < .001$, $d = -0.57$. There were no significant gender differences when risk perception regarding COVID-19 was considered, $t(233) = 1.03$, $p = .304$, $d = 0.15$. Finally, there was a significant gender difference regarding institutional trust, $t(233) = 3.17$, $p = .002$, $d = 0.46$, with males ($M = 3.08$, $SD = 0.62$) scoring higher than females ($M = 2.81$, $SD = 0.58$). Cohen's *d* scores indicated that the significant differences had small to medium effect sizes, as the scores were smaller than or close to 0.50.

Table 8

Results of the Independent t-tests Comparing Males and Females on the Variables

Variable	Males (n = 68)		Females (n = 167)		$t(233)$	p	Cohen's d
	M	*SD*	*M*	*SD*			
The ability to distinguish correctly between real and fake news [a]	**4.69**	1.88	4.08	1.81	2.33	.021	0.34
Systematic processing [b]	**3.83**	0.70	3.54	0.80	2.63	.009	0.38
Cognitive capacity [b]	4.06	0.58	3.94	0.54	1.53	.127	0.22
Risk perception regarding COVID-19 [b]	3.47	0.81	3.35	0.76	1.03	.304	0.15
Risk perception regarding the vaccine [b]	2.35	1.02	**2.97**	1.10	-3.99	< .001	-0.57
Institutional trust [b]	**3.08**	0.62	2.81	0.58	3.17	.002	0.46

Note. N = 235. Significant higher mean scores are displayed in bold. All p values in this table are two-tailed.

[a] The variable was measured by the number of correct answers in distinguishing between real and fake news, ranging from 0 (no correct answers) to 7 (all correct answers).

[b] The variable was measured via a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Hypothesis Testing

For testing of the hypotheses, p-values below .05 were considered significant and p-values between .05 and .10 were considered marginally significant. The Pearson correlation coefficients were one-tailed. It was hypothesised that systematic processing would correlate positively with the ability to distinguish correctly between real and fake news (H1). The results showed a significant positive correlation as expected, $r(233) = .13$, $p = .027$. Therefore, the higher the systematic processing, the higher the ability to distinguish correctly between real and fake news was. Hence, hypothesis 1 was accepted.

Second, it was hypothesised that cognitive capacity would correlate positively with the ability to distinguish correctly between real and fake news (H2a). The results showed that cognitive capacity was not significantly correlated with the ability to distinguish correctly between real and fake news, $r(233) = .08$, $p = .107$. Thus, cognitive capacity did not significantly predict the ability to distinguish correctly between real and fake news, and hypothesis 2a was rejected. In addition, it was hypothesised that cognitive capacity would correlate positively with systematic processing (H2b). The results showed a significant positive correlation as expected, $r(233) = .37$, $p < .001$. Hence, the higher the person's cognitive capacity, the better their systematic processing ability. Hypothesis 2b was thus accepted.

Third, it was hypothesised that risk perception would correlate negatively with the ability to distinguish between real and fake news (H3a). The results showed a significant positive correlation between the ability to distinguish correctly between real and fake news

and risk perception regarding COVID-19, $r(233) = .14$, $p = .014$. By contrast, a significant negative correlation was found between the ability to distinguish correctly between real and fake news and risk perception regarding the vaccine, $r(233) = -.49$, $p < .001$. Thus, the more a person perceived a risk regarding COVID-19 and the less their risk perception regarding the vaccine, the better they could distinguish correctly between real and fake news. Therefore, hypothesis 3a was partially accepted. Risk perception regarding the vaccine was consistent with the hypothesis. However, risk perception regarding COVID-19 was not in line with the hypothesis, as it was positively correlated.

Furthermore, it was hypothesised that risk perception would correlate negatively with systematic processing (H3b). The results showed a significant positive correlation between systematic processing and risk perception regarding COVID-19, $r(233) = .14$, $p = .018$. A significant negative correlation was found between systematic processing and risk perception regarding the vaccine, $r(233) = -.16$, $p = .006$. Therefore, the higher the risk perception regarding COVID-19 and the lower the risk perception regarding the vaccine, the higher the systematic processing was. Hence, hypothesis 3b was partially accepted. The result for risk perception regarding the vaccine was in line with the hypothesis, but that regarding COVID-19 risk was not consistent with the expected direction of the hypothesised relationship.

Lastly, it was hypothesised that institutional trust would correlate negatively with the ability to distinguish correctly between real and fake news (H4a). The results indicated a significant positive correlation between the ability to distinguish correctly between real and fake news and institutional trust, $r(233) = .39$, $p < .001$. Therefore, the higher a person's trust in institutions, the more they were able to distinguish correctly between real and fake news. Hence, hypothesis 4a was rejected since the direction of the relationship was not as expected.

Furthermore, it was hypothesised that institutional trust would correlate negatively with systematic processing (H4b). The results showed a significant positive correlation between systematic processing and institutional trust, $r(233) = .17$, $p = .004$. Therefore, the higher the person's institutional trust, the stronger was their systematic processing. Hypothesis 4b was thus rejected since the expected direction of the hypothesis was disconfirmed.

Multiple Regression Analysis

A multiple regression analysis was performed to assess whether the ability to distinguish correctly between real and fake news was significantly predicted by any of the following variables: systematic processing, cognitive capacity, risk perception regarding

COVID-19, risk perception regarding the vaccine, and institutional trust. Table 9 shows the results. The regression model significantly predicted the ability to distinguish correctly between real and fake news, $F(5, 229) = 16.81$, $p < .001$, with an R^2 of .27. This result indicates that 27% of the variance in the ability to distinguish correctly between real and fake news was explained by the predictors in the regression model.

Risk perception regarding the vaccine contributed significantly and negatively to the prediction of the ability to distinguish correctly between real and fake news, β = -.39, $t(229) = -5.86$, $p < .001$. Institutional trust contributed significantly and positively to the prediction of the ability to distinguish correctly between real and fake news, β = .19, $t(229) = 2.75$, $p = .006$. Thus, the ability to distinguish correctly between real and fake news increased when risk perception regarding the vaccine decreased and institutional trust increased. Systematic processing, cognitive capacity, and risk perception regarding COVID-19 were not significant predictors in the model when combined with all predictors.

Table 9

Linear Model of Predictors of the Ability to Distinguish Correctly Between Real and Fake News

Variable	β	*SE*	*B*	*t*(229)	95% CI		*p*	VIF
					LL	*UL*		
Constant		1.13	3.30	3.20	1.08	5.52	.004	
Systematic processing	.02	0.15	0.04	0.25	-0.25	0.33	.806	1.21
Cognitive capacity	.04	0.20	0.13	0.62	-0.28	0.53	.536	1.17
Risk perception COVID-19	.01	0.14	0.03	0.19	-0.25	0.30	.853	1.10
Risk perception vaccine	**-.39**	0.11	-0.65	-5.86	-0.86	-0.43	< .001	1.37
Institutional trust	**.19**	0.21	0.57	2.75	0.16	0.97	.006	1.43

Note. $N = 235$. $R^2 = .27$. CI = confidence interval; *LL* = lower limit, *UL* = upper limit. Significant beta coefficients appear in bold.

In a second step, a multiple regression analysis was performed to investigate whether systematic processing was significantly predicted by cognitive capacity, risk perception regarding COVID-19, risk perception regarding the vaccine, and institutional trust. Table 10 shows the results of the analysis. The regression model significantly predicted systematic processing, $F(4, 230) = 12.08$ $p < .001$, with an R^2 of .17. Therefore, 17% of the variance in systematic processing was explained by the predictors in the regression model.

Cognitive capacity contributed significantly and positively to the prediction of systematic processing, β = .36, $t(230) = 6.00$, $p = < .001$. Hence, systematic processing

increased when cognitive capacity increased. Risk perception regarding COVID-19, risk perception regarding the vaccine, and institutional trust were not significant predictors in the model when combined with all predictors.

Table 10

Linear Model of Predictors of Systematic Processing

Variable	β	*SE*	*B*	*t*(230)	95% CI		*p*	VIF
					LL	*UL*		
Constant		0.50	1.27	2.54	0.29	2.25	.012	
Cognitive capacity	**.36**	0.09	0.51	6.00	0.34	0.67	< .001	1.01
Risk perception COVID-19	.10	0.06	0.10	1.56	-0.03	0.22	.121	1.09
Risk perception vaccine	-.10	0.05	-0.07	-1.41	-0.17	0.03	.159	1.36
Institutional trust	.05	0.09	0.07	0.76	-0.11	0.25	.450	1.42

Note. $N = 235$. $R^2 = .17$. CI = confidence interval*; LL* = lower limit, *UL* = upper limit. Significant beta coefficients appear in bold.

Mediation Analysis

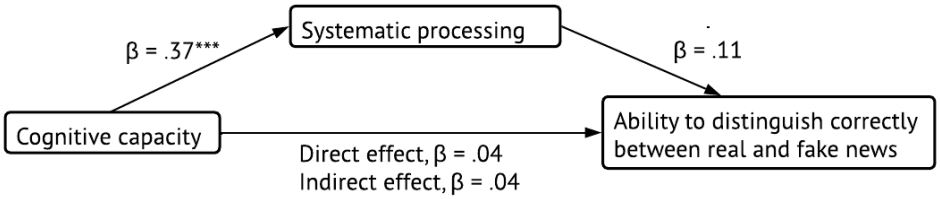
Several mediation analyses were performed to investigate whether systematic processing acted as a mediator between the relationships of the independent variables and the ability to distinguish correctly between real and fake news. The correlation between the independent variables and the ability to distinguish correctly between real and fake news, the correlation between the independent variables and the mediator, and the correlation between the mediator and the ability to distinguish correctly between real and fake news had to be significant to have a significant indirect effect. Indirect effects in which the bootstrapped 95% confidence interval (CI) did not contain zero were considered significant.

It was hypothesised that systematic processing mediates the relationship between cognitive capacity and the ability to distinguish correctly between real and fake news (H2c). Figure 2 shows that the correlation between cognitive capacity and the ability to distinguish correctly between real and fake news was not significant, $\beta = .04$, $t(235) = 0.57$, $p = .569$. A mediation effect was therefore unlikely. For the sake of completeness, the mediation analysis is nonetheless presented. The correlation between cognitive capacity and systematic processing was significant and positive, $\beta = .37$, $t(235) = 6.14$, $p < .001$. The correlation between systematic processing and the ability to distinguish correctly between real and fake news was not significant, $\beta = .11$, $t(235) = 1.58$, $p = .117$. No significant indirect effect of

cognitive capacity on the ability to distinguish correctly between real and fake news, through systematic processing, was found, β = .04, 95% BCa CI [-0.01, 0.10]. The results indicate that systematic processing did not significantly mediate the relationship between cognitive capacity and the ability to distinguish correctly between real and fake news. Hence, hypothesis 2c was rejected.

Figure 2

Mediation Model of Cognitive Capacity as a Predictor of the Ability to Distinguish Correctly Between Real and Fake News, Through Systematic Processing



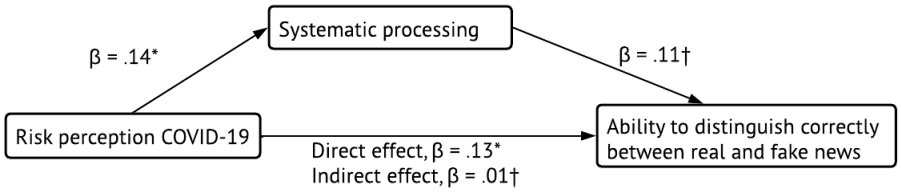
Note. $N = 235$.

***$p < .001$.

It was hypothesised that systematic processing would mediate the relationship between risk perception and the ability to distinguish correctly between real and fake news (H3c). Figure 3 shows that the correlation between risk perception regarding COVID-19 and the ability to distinguish correctly between real and fake news was significant and positive, β = .13, $t(235) = 1.99$, $p = .048$. The correlation between risk perception regarding COVID-19 and systematic processing was significant and positive, β = .14, $t(235) = 2.11$, $p = .036$. The correlation of systematic processing and the ability to distinguish correctly between real and fake news was marginally significant and positive, β = .11, $t(235) = 1.65$, $p = .010$. There was a marginally significant indirect effect of risk perception about COVID-19 on the ability to distinguish correctly between real and fake news through systematic processing, β = .01, 95% BCa CI [.00, .04]. Overall, the results indicated a partial mediation effect of systematic processing. That is, systematic processing partly mediated between a person's risk perception about COVID-19 and their ability to distinguish correctly between real and fake news. The direct effect of risk perception regarding COVID-19 on the ability to distinguish correctly between real and fake news was diminished when systematic processing was included. Hence, hypothesis 3c was (partly) accepted.

Figure 3

Mediation Model of Risk Perception Regarding COVID-19 as a Predictor of the Ability to Distinguish Correctly Between Real and Fake News, Through Systematic Processing



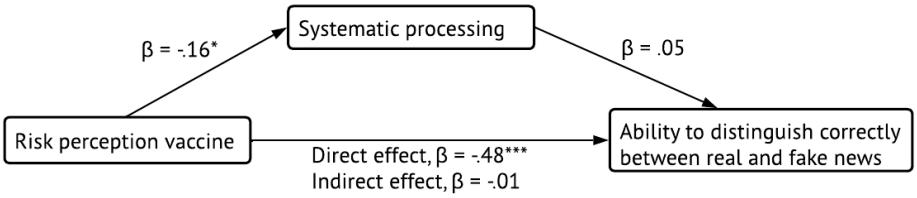
Note. $N = 235$.

*$p < .05$. †$p < .10$.

It was hypothesised that systematic processing would mediate the relationship between risk perception and the ability to distinguish correctly between real and fake news (H3c). Figure 4 shows that the correlation between risk perception regarding the vaccine and the ability to distinguish correctly between real and fake news was significant and negative, β = -.48, $t(235) = -8.28$, $p < .001$. The correlation between risk perception regarding the vaccine and systematic processing was significant and negative, β = -.16, $t(235) = -2.51$, $p = .013$. The correlation between systematic processing and the ability to distinguish correctly between real and fake news was not significant, β = .05, $t(235) = 0.82$, $p = .411$. No significant indirect effect of risk perception about vaccines on the ability to distinguish correctly between real and fake news, through systematic processing, was found, β = -.01, 95% BCa CI [-.03, .01]. Therefore, the results showed that systematic processing did not significantly mediate the relationship between vaccine risk perception and the ability to distinguish correctly between real and fake news. Hence, hypothesis 3c was (partly) rejected.

Figure 4

Mediation Model of Risk Perception Regarding the Vaccine as a Predictor of the Ability to Distinguish Correctly Between Real and Fake News, Through Systematic Processing



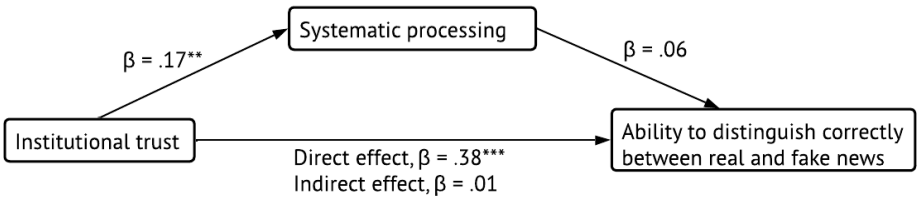
Note. $N = 235$.

*$p < .05$. ***$p < .001$.

Lastly, it was hypothesised that systematic processing mediates the relationship between institutional trust and the ability to distinguish correctly between real and fake news (H4c). Figure 5 shows that the correlation between institutional trust and the ability to distinguish correctly between real and fake news was significant and positive, β = .38, $t(235) = 6.25$, $p < .001$. The correlation between institutional trust and systematic processing was significant and positive, β = .17, $t(235) = 2.65$, $p = .009$. The correlation between systematic processing and the ability to distinguish correctly between real and fake news was not significant, β = .06, $t(235) = 0.98$, $p = .328$. No significant indirect effect of institutional trust on the ability to distinguish correctly between real and fake news, through systematic processing, was found, β = .01, 95% BCa CI [-.01, .04]. Overall, the results showed that systematic processing did not significantly mediate the relationship between institutional trust and the ability to distinguish correctly between real and fake news. Hence, hypothesis 4c was rejected.

Figure 5

Mediation Model of Institutional Trust as a Predictor of the Ability to Distinguish Correctly Between Real and Fake News, Through Systematic Processing



Note. $N = 235$.

**$p < .01$. ***$p < .001$.

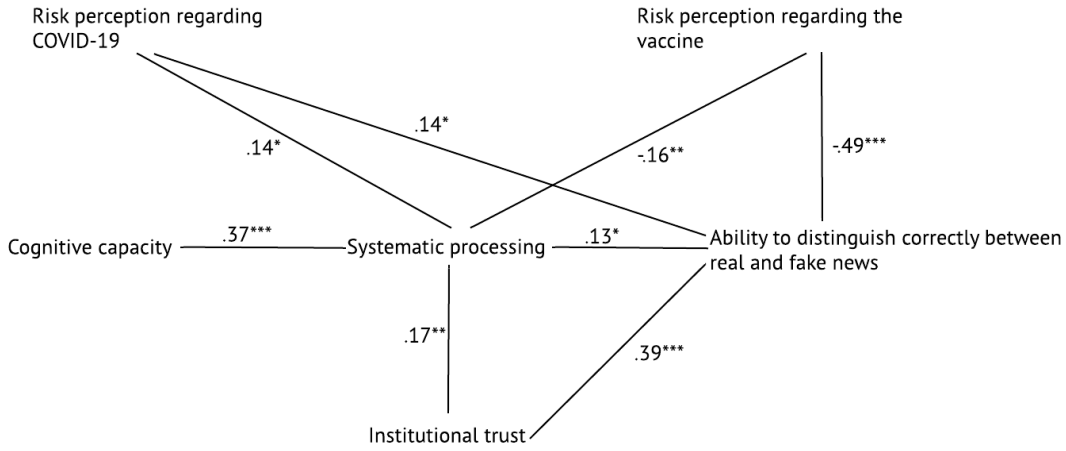
General Findings Regarding the Hypotheses

Overall, systematic processing, risk perception regarding COVID-19, and institutional trust were significantly and positively correlated with the ability to distinguish correctly between real and fake news. Risk perception regarding the vaccine was significantly and negatively correlated with the ability to distinguish correctly between real and fake news. Moreover, cognitive capacity, risk perception regarding COVID-19, and institutional trust were significantly and positively correlated with systematic processing. Risk perception regarding the vaccine was significantly and negatively correlated with systematic processing. The correlation coefficients between the independent variables and the dependent variables are shown in Figure 6.

Furthermore, a marginally significant partial mediation effect of risk perception regarding COVID-19 on the ability to distinguish correctly between real and fake news, through systematic processing, was found. The mediation effects of systematic processing between the other predictors and the ability to distinguish correctly between real and fake news were not significant (see Table 11).

Figure 6

Model With Pearson Correlation Coefficients Between the Independent Variables and the Dependent Variables



Note. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 11

Results of the Mediation Analyses With the Indirect Effects of the Predictors on the Ability to Distinguish Correctly Between Real and Fake News, Through Systematic Processing

Independent variable	Indirect effect		95% CI	
	β	*B*	*LL*	*UL*
Cognitive capacity	.04	.14	-.01	.10
Risk perception COVID-19	**.01**[†]	.04	.00	.04
Risk perception vaccine	-.01	-.01	-.03	.01
Institutional trust	.01	.03	-.01	.04

Note. $N = 235$. The ability to distinguish correctly between real and fake news was the outcome variable. Systematic processing was the mediation variable. CI = confidence interval; *LL* = lower limit, *UL* = upper limit. The 95% confidence interval for the indirect effect is a BCa bootstrapped confidence interval. The marginally significant beta coefficient appears in bold.

[†] Marginally significant (the precise score of the 95% CI was -.0022, .04).

Likelihood and Severity

Until now, risk perception regarding COVID-19 was in this study considered as a single variable. However, factor analysis for "risk perception regarding COVID-19" items indicated the presence of two factors, namely perceived likelihood regarding COVID-19 and perceived severity regarding COVID-19. Therefore, the previous analyses were run again for each of the two factors separately. Table 12 shows that perceived likelihood ($M = 3.56$, $SD = 0.92$) and perceived severity ($M = 3.21$, $SD = 1.04$) scored above the midpoint of the 5-point scale. Therefore, respondents viewed the likelihood of contracting COVID-19 and the severity of the virus to be above average.

Moreover, the findings showed significant positive correlations between the above factors and the ability to distinguish correctly between real and fake news. The results for the correlation involving perceived likelihood were, $r(233) = .12$, $p = .034$, and those for perceived severity were, $r(233) = .11$, $p = .047$. Thus, the higher the perceived likelihood and severity, the more the person was able to distinguish correctly between real and fake news. In addition, the results showed (marginally) significant and positive correlations between systematic processing and, respectively, perceived likelihood, $r(233) = .10$, $p = .064$, and perceived severity, $r(233) = .12$, $p = .038$. Therefore, the higher the perceived likelihood and severity, the stronger was the person's systematic processing. These findings were similar (regarding significance and direction) to the results of the overall scale for the risk perception regarding COVID-19.

Table 12

Descriptive Statistics and Correlations of the Variables

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. The ability to distinguish correctly between real and fake news [a]	4.26	1.85	-								
2. Systematic processing [b]	3.62	0.78	.13*	-							
3. Cognitive capacity [b]	3.97	0.56	.08	.37***	-						
4. Likelihood COVID-19 [b]	3.56	0.92	.12*	.10†	.10†	-					
5. Severity COVID-19 [b]	3.21	1.04	.11*	.12*	-.07	.25***	-				
6. Risk perception vaccine [b]	2.79	1.11	-.49***	-.16**	-.04	-.18**	-.15*	-			
7. Institutional trust [b]	2.88	0.61	.39***	.17**	.11*	.14*	.30***	-.51***	-		
8. Age	31.11	13.73	.05	.22***	.14*	.09†	.19**	-.07	.19**	-	
9. Gender [c]	1.71	0.45	-.15*	-.17**	-.10†	-.16**	.04	.25***	-.20**	-.10†	-

Note. $N = 235$.

[a] The variable was measured by the number of correct answers in distinguishing between real and fake news, ranging from 0 (no correct answers) to 7 (all correct answers).

[b] The variable was measured via a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

[c] 1 = males, 2 = females.

†$p < .10$ (one-tailed). *$p < .05$ (one-tailed). **$p < .01$ (one-tailed). ***$p < .001$ (one-tailed).

Multiple Regression Analysis

Table 13 shows that the ability to distinguish correctly between real and fake news was significantly predicted in the regression model by the following variables: systematic processing, cognitive capacity, perceived likelihood, perceived severity, risk perception regarding the vaccine, and institutional trust, $F(6, 228) = 13.98$, $p < .001$, $R^2 = .27$. Risk perception regarding the vaccine contributed significantly and negatively to the prediction of the ability to distinguish correctly between real and fake news, $\beta = -.39$, $t(228) = -5.77$, $p <$

.001. Institutional trust contributed significantly and positively to the prediction of the ability to distinguish correctly between real and fake news, β = .19, $t(228) = 2.77$, $p = .006$. Thus, the ability to distinguish correctly between real and fake news increased when risk perception regarding the vaccine decreased and institutional trust increased. Systematic processing, cognitive capacity, perceived likelihood, and perceived severity were not significant predictors in the model.

Table 14 shows that systematic processing was significantly predicted in the regression model by cognitive capacity, perceived likelihood, perceived severity, risk perception regarding the vaccine, and institutional trust, $F(5, 229) = 9.81$, $p < .001$, $R^2 = .18$. Cognitive capacity contributed significantly and positively to the prediction of systematic processing, β = .37, $t(229) = 6.06$, $p < .001$. Perceived severity contributed marginally significantly and positively to the prediction of systematic processing, β = .11, $t(229) = 1.69$, $p = .093$. Thus, systematic processing increased when cognitive capacity and perceived severity increased. Perceived likelihood, perceived severity, risk perception regarding the vaccine, and institutional trust were not significant predictors in the model.

The findings from the regression analysis showed a small difference between the results from the overall scale for risk perception regarding COVID-19 and the two separate factors. Risk perception regarding COVID-19 was not significantly predicting systematic processing. Perceived likelihood was also not significantly predicting systematic processing. However, perceived severity was marginally significantly predicting systematic processing.

Table 13

Linear Model of Predictors of the Ability to Distinguish Correctly Between Real and Fake News

Variable	β	*SE*	*B*	*t*(228)	95% CI		*p*	VIF
					LL	*UL*		
Constant		1.14	3.34	2.94	1.10	5.58	.004	
Systematic processing	.02	0.15	0.04	0.27	-0.25	0.33	.791	1.21
Cognitive capacity	.03	0.21	0.11	0.55	-0.29	0.52	.581	1.20
Likelihood COVID-19	.02	0.12	0.05	0.39	-0.19	0.28	.697	1.10
Severity COVID-19	-.01	0.11	-0.02	-0.15	-0.23	0.20	.884	1.19
Risk perception vaccine	**-.39**	0.11	-0.64	-5.77	-0.86	-0.42	< .001	1.39
Institutional trust	**.19**	0.21	0.58	2.77	0.17	0.99	.006	1.47

Note. $N = 235$. $R^2 = .27$. CI = confidence interval*; LL* = lower limit, *UL* = upper limit. Significant beta coefficients appear in bold.

Table 14

Linear Model of Predictors of Systematic Processing

Variable	β	*SE*	*B*	*t*(229)	95% CI		*p*	VIF
					LL	*UL*		
Constant		0.50	1.31	2.61	0.32	2.29	.010	
Cognitive capacity	**.37**	0.09	0.52	6.06	0.35	0.69	< .001	1.04
Likelihood COVID-19	.01	0.05	0.01	0.20	-0.09	0.12	.842	1.10
Severity COVID-19	**.11**[†]	0.05	0.08	1.69	-0.01	0.18	.093	1.17
Risk perception vaccine	-.11	0.05	-0.07	-1.50	-0.17	0.02	.135	1.37
Institutional trust	.04	0.09	0.06	0.59	-0.13	0.24	.555	1.47

Note. $N = 235$. $R^2 = .18$. CI = confidence interval*; LL* = lower limit, *UL* = upper limit. (Marginally) significant beta coefficients appear in bold.

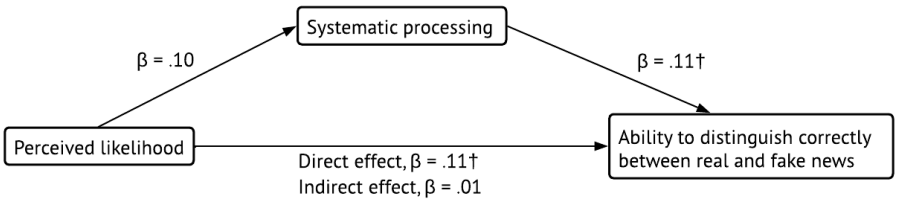
[†] Marginally significant.

Mediation Analysis

Mediation analysis indicated that the correlation between perceived likelihood and the ability to distinguish correctly between real and fake news was marginally significant and positive, β = .11, $t(235) = 1.66$, $p = .099$ (see Figure 7). Perceived likelihood did not significantly correlate with systematic processing, β = .10, $t(235) = 1.53$, $p = .128$. Systematic processing did marginally significantly and positively correlate with the ability to distinguish correctly between real and fake news in the model of perceived likelihood, β = .11, $t(235) = 1.76$, $p = .079$. No significant indirect effect of perceived likelihood on the ability to distinguish correctly between real and fake news, through systematic processing, was found, β = .01, 95% BCa CI [-.01, .04]. Overall, these results indicate that systematic processing did not significantly mediate the relationship between perceived likelihood and the ability to distinguish correctly between real and fake news.

Figure 7

Mediation Model of Perceived Likelihood in Terms of COVID-19 as a Predictor of the Ability to Distinguish Correctly Between Real and Fake News, Through Systematic Processing

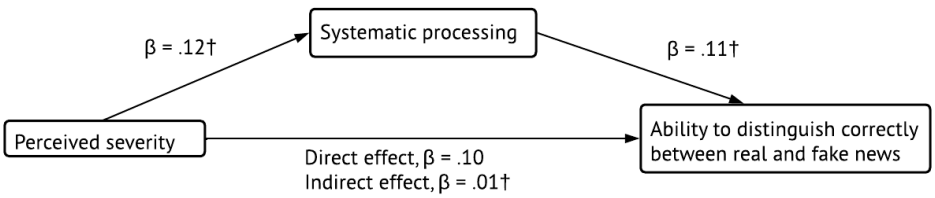


Note. $N = 235$.
$^{\dagger}p < .10$.

The correlation between perceived severity and the ability to distinguish correctly between real and fake news was not significant, β = .10, $t(235) = 1.47$, $p = .143$ (see Figure 8). A mediation effect was therefore unlikely. Perceived severity did marginally significantly and positively correlate with systematic processing, β = .12, $t(235) = 1.78$, $p = .077$. Systematic processing did marginally significantly and positively correlate with the ability to distinguish correctly between real and fake news in the model for perceived severity, β = .11, $t(235) = 1.75$, $p = .081$. There was a marginal significant indirect effect of perceived severity on the ability to distinguish correctly between real and fake news through systematic processing, β = .01, 95% BCa CI [.00, .04]. Although the correlation between perceived severity and the ability to distinguish correctly between real and fake news was not significant, a marginal significant partial mediation effect occurred through systematic processing. Thus, the direct effect of perceived severity on the ability to distinguish correctly between real and fake news was marginally significantly diminished when systematic processing was included.

Figure 8

Mediation Model of Perceived Severity in Terms of COVID-19 as a Predictor of the Ability to Distinguish Correctly Between Real and Fake News, Through Systematic Processing



Note. $N = 235$.

$^{\dagger}p < .10$.

The findings from the mediation analysis showed slight differences between the overall scale of risk perception regarding COVID-19 and the two separate factors. There was a marginally significant partial mediation effect of risk perception regarding COVID-19 on the ability to distinguish correctly between real and fake news, through systematic processing. Systematic processing did also marginally significantly mediate the relationship between perceived severity and the ability to distinguish correctly between real and fake news. However, systematic processing did not significantly mediate the relationship between perceived likelihood and the ability to distinguish correctly between real and fake news.

Differences and Similarities Between Females and Males

The analyses were also conducted separately for males and females (see Appendix D), as they significantly differed in the mean scores on the variables. In doing so, the following similarities were found. For both females and males, the ability to distinguish correctly between real and fake news was significantly and negatively correlated with risk perception regarding the vaccine, while it was significantly and positively correlated with institutional trust. The ability to distinguish correctly between real and fake news was not significantly correlated with cognitive capacity for both genders. Lastly, for both females and males, no mediation effects of systematic processing were found between the predictors and the ability to distinguish correctly between real and fake news.

Furthermore, differences were found between females and males. First, for females, the ability to distinguish correctly between real and fake news was (marginally) significantly and positively correlated with systematic processing and risk perception regarding COVID-19. In addition, for females, systematic processing was significantly and positively correlated with risk perception regarding COVID-19 and institutional trust, while it was significantly and negatively correlated with risk perception regarding the vaccine. These correlations were not significant for males.

Lastly, the regression results were nearly identical for both genders. Both for females and males, risk perception regarding the vaccine (negatively) and institution trust (positively) significantly predicted the ability to distinguish correctly between real and fake news in a regression model. Cognitive capacity significantly and positively predicted systematic processing in another regression model for both females and males. However, risk perception regarding COVID-19 significantly predicted systematic processing for males but not females.

When focussing on the hypotheses, H2a, H2c, H3a (regarding COVID-19), H3b (regarding COVID-19), H3c, H4a, H4b, H4c were rejected for females and males. H2b and H3a (regarding the vaccine) were accepted for both genders. H1 and H3b (regarding the vaccine) were accepted for females but not for males.

Discussion

This study focuses on individual characteristics that determine whether people can distinguish correctly between COVID-19-related real versus fake news. The study analysed the correlation between, on the one hand, systematic processing, cognitive capacity, risk perception, and institutional trust and, on the other, the ability to distinguish correctly between real and fake news. In addition, this study analysed how cognitive capacity, risk perception, and institutional trust correlated with systematic processing. Furthermore, it analysed whether systematic processing mediated the relationships between the predictors and the ability to distinguish correctly between real and fake news. These possibilities were tested through correlational research and mediation analyses. The data were collected through an online survey, with 235 respondents.

Consistent with hypothesis 1, systematic processing correlated significantly and positively with the ability to distinguish correctly between real and fake news. This suggests, as in previous studies (Ali & Zain-ul-Abdin, 2020; Bronstein et al., 2018), that people who process more systematically judge on the plausibility of information. Therefore, systematic processing is associated with the ability to distinguish correctly between real and fake news (Pennycook & Rand, 2019a, 2019b) and not believing fake news.

Inconsistent with hypothesis 2a, cognitive capacity was not significantly correlated with the ability to distinguish correctly between real and fake news. Prior research found that individuals with high cognitive capacity were better able to distinguish correctly between real and fake news (Sindermann et al., 2021; Zhu et al., 2010; Greene & Murphy, 2020). One possible explanation for this difference in results is the measurement method. Unlike previous studies, the current study measured cognitive capacity through self-report items. People do not want to perceive themselves as having poor cognitive capacity. Self-protection mechanisms can maintain people's self-esteem but may cause them to perceive their ability as above average (Alicke, 1985; Heck et al., 2018). Therefore, there could have been discrepancies between the self-perceived ratings and a possible objective measure. This may

have led to a “ceiling effect” (overestimation and low variance) in respondents' answers to the cognitive capacity items, resulting in a nonsignificant correlation. Additional research is recommended to analyse cognitive capacity through objective measures.

In line with hypothesis 2b, the results showed that cognitive capacity was significantly and positively correlated with systematic processing. It suggests, as in previous studies (Chaiken & Maheswaran, 1994; Wang et al., 2022; Griffin et al., 1999), that systematic processing required cognitive capacity because such processing is cognitively effortful. Hence, people with high cognitive capacity were more capable of processing systematically.

Inconsistent with hypothesis 2c, the results showed no significant mediation effect of systematic processing between cognitive capacity and the ability to distinguish correctly between real and fake news. This finding is not in accordance with previous studies (see hypotheses 1 and 2b). There was no significant direct effect of cognitive capacity on the ability to distinguish correctly between real and fake news. Therefore, a mediation effect was unlikely. Further research is needed to verify the results.

Consistent with hypothesis 3a, the results showed that risk perception regarding the vaccine was significantly and negatively correlated with the ability to distinguish correctly between real and fake news. This finding is in line with previous studies (DiFonzo & Bordia, 2007; Kim & Kim, 2020; Pennycook et al., 2018), which found that people with high risk perceptions experienced distrust and encountered rumours that distorted social facts, and consequently read more fake news. People with high risk perceptions regarding the vaccine encountered frequently fake news about the negative effects of the vaccine. Encountering fake news repeatedly can increase the belief in such news through the familiarity principle. This made it difficult to distinguish correctly between real and fake news.

Risk perception regarding COVID-19 was not in line with hypothesis 3a and prior research. In the current study, this variable was positively correlated with the ability to distinguish correctly between real and fake news. It is possible that people with a high risk perception regarding COVID-19 did not encounter much fake news about the risks of COVID-19, as the risk of COVID-19 is a less used topic for fake news sources. Fake news sources regarding COVID-19 mainly focus on the vaccine, face masks, and are claiming that the virus is not harmful. Therefore, individuals were not influenced by the familiarity principle and were relatively capable at distinguishing correctly between real and fake news. Previous studies used frequently discussed fake news topics–such as immigration–and fake news about democrats or republicans. Hence, individuals were influenced by the familiarity

principle. Therefore, previous studies might have found a negative relationship between risk perception and the ability to distinguish correctly between real and fake news.

In addition, fake news sources mainly discuss the risks of vaccines. Therefore, people who were incapable of distinguishing correctly between real and fake news were relatively likely to have a high risk perception regarding the vaccine. Because fake news sources report less about the risks of COVID-19, it was less likely that risk perception regarding COVID-19 was negatively correlated with the ability to distinguish correctly between real and fake news.

In line with hypothesis 3b, this study found that risk perception regarding the vaccine was significantly and negatively correlated with systematic processing. This is consistent with previous research that found that a high risk perception increased the overall cognitive demand, thereby reducing the efficiency of processing and leading to less systematic processing (Eysenck et al., 2007; Weeks, 2015).

The significant positive correlation between risk perception regarding COVID-19 and systematic processing was not in line with hypothesis 3b and previous research. A possible explanation for this discrepancy is that there may have been a confounding variable. By focusing on the distinctions between risk perception regarding COVID-19 and the vaccine, it was found in the data, and via the study of Dobson (2022) that a high risk perception regarding the vaccine was significantly correlated with low institutional trust. This finding is logical, since vaccines are produced by institutions, and governments promote and distribute them. Conversely, risk perception regarding COVID-19 correlated significantly and positively with institutional trust. Institutions present information about the risks of COVID-19 to make people aware of these risks (RIVM, 2022). It is reasonable that people with high institutional trust will rely on and listen to institutions and consequently have high risk perceptions regarding COVID-19.

The findings of this study showed that low institutional trust was significantly correlated with limited systematic processing and a limited ability to distinguish correctly between real and fake news, and vice versa. Thus, institutional trust might have been a confounding variable. If so, such institutional trust could influence the relationship between risk perception (regarding both vaccines and COVID-19) and systematic processing and would therefore also influence the ability to distinguish correctly between real and fake news. The possibility that institutional trust was a confounding variable fell outside the scope of this research. Further research into this relationship is desirable.

In line with hypothesis 3c, this study found a marginally significant partial mediation effect of systematic processing between risk perception regarding COVID-19 and the ability

to distinguish correctly between real and fake news. However, no significant mediation effect of systematic processing was found between risk perception regarding the vaccine and the ability to distinguish correctly between real and fake news. In the latter mediation model, systematic processing had no significant effect on the ability to distinguish correctly between real and fake news. Overall, the findings are partly in line with previous studies (see hypotheses 1 and 3b). Further research is needed to verify the results.

Inconsistent with hypothesis 4a, this study found that institutional trust was significantly and positively correlated with the ability to distinguish correctly between real and fake news. Previous studies found that people with high institutional trust were less likely to distrust sources (Kim, 2014; Yamagishi et al., 2015). Therefore, it is more difficult for people with high institutional trust to distinguish correctly between real and fake news. A possible explanation for the discrepancy between the findings of previous studies and this one is that other studies did not focus on fake news. It seems possible that high institutional trust could result in trusting other sources, but not in trusting "untrustworthy" fake news sources.

Another explanation for the negative correlation is that low institutional trust correlates with paranoia (Hofstadter, 1964, as cited in Linden et al., 2020; Freeman et al., 2020). People with low institutional trust are relatively likely to distrust institutions, rely on contrary information, and regard messages from institutions as disinformation. Hence, these people are less able to distinguish correctly between real and fake news. Future research should control for the variable "paranoia" when analysing the relationship between institutional trust and the ability to distinguish correctly between real and fake news.

Inconsistent with hypothesis 4b, this study found that institutional trust was significantly and positively correlated with systematic processing. Previous studies found that high institutional trust reduced the motivation to process information systematically (Trumbo & McComas, 2003, 2008). However, those studies focused on different topics, namely nuclear power incidents and environmentally related cancer. Hence, the risks studied might have been perceived differently from the risks examined in this research, and the protective behaviour would differ. For example, nuclear power incidents could be perceived as "out of my control", whereas coping mechanisms related to preventing COVID-19 are relatively easy for individuals to perform. In addition, the risks of pandemics such as COVID-19 are perceived as more likely and more severe than many other risks (RIVM, 2016). This may have led to a specific scenario in which institutions have to act and communicate in unique ways, which could influence people's processing styles and resulted in unexpected findings.

In addition, previous studies found that institutional trust was influenced by one's position in the labour market as well as education and skills (Foster & Frieden, 2017; Hudson, 2006). People with high levels of these determinants were more positive about institutions, had higher cognitive capacity, and processed information more systematically (Ryu & Kim, 2014). This point is in line with the present findings, in which cognitive capacity and systematic processing were significantly and positively correlated with institutional trust. It is possible that systematic processing was enhanced not by institutional trust but rather by the determinants of institutional trust. This possibility was beyond the scope of the study, and future research that controls for these determinants is recommended.

The findings did not support hypothesis 4c. No significant mediation effect of systematic processing was found between institutional trust and the ability to distinguish correctly between real and fake news. This finding was not in accordance with the studies that informed hypotheses 1 and 4b. Systematic processing had in the mediation model no significant effect on the ability to distinguish correctly between real and fake news. Therefore, a mediation effect was unlikely. Further research is needed to verify the results.

Additional Findings

Likelihood and Severity

Factor analysis identified two factors that contributed to the variable “risk perception regarding COVID-19”. These were perceived likelihood and perceived severity. Since both factors complemented each other, helped to explain risk perception regarding COVID-19, and contained only two questionnaire items each, they were combined into a single variable. Nevertheless, additional analyses were conducted for each of the two factors separately. They yielded largely equivalent results to those of the initial analysis for “risk perception regarding COVID-19”. However, two major differences were found.

First, the factors had partially different results from the overall scale in the regression analysis. Risk perception regarding COVID-19 was not significantly predicting systematic processing in a conducted regression analysis. Perceived likelihood was also not significantly predicting systematic processing in a similar regression analysis. However, perceived severity did significantly predict systematic processing in the same regression analysis. Possibly, risk perception regarding COVID-19 was not a significant predictor of systematic processing in the regression analysis due to the perceived likelihood scale.

Second, the factors had partially different results from the overall scale in the mediation analysis. The relationship between risk perception regarding COVID-19 and the

ability to distinguish correctly between real and fake news was marginally significantly mediated by systematic processing. Systematic processing had also a marginally significant partial mediation effect between perceived severity and the ability to distinguish correctly between real and fake news. By contrast, systematic processing had no significant mediation effect between perceived likelihood and the ability to distinguish correctly between real and fake news. Therefore, the factor "perceived severity" possibly caused the variable "risk perception regarding COVID-19" to have a marginally significant partial mediating effect.

Regression Analysis

Furthermore, the results of the regression analysis indicated that vaccine-related risk perception significantly and negatively contributed to the prediction of the ability to distinguish correctly between real and fake news. Institutional trust significantly and positively contributed to the same prediction. Systematic processing, cognitive capacity, and risk perception regarding COVID-19 were not significant predictors in the model. These findings are not in line with previous studies. Previously, from an extensive list of variables, systematic processing, cognitive capacity, risk perception, and institutional trust (among others) were significant predictors of the ability to distinguish correctly between real and fake news (Kim & Kim, 2020; Douglas et al., 2017, 2019).

Another regression analysis in the current study showed that cognitive capacity significantly and positively contributed to the prediction of systematic processing. Risk perception regarding COVID-19, risk perception regarding the vaccine, and institutional trust were not significant predictors in the model. These findings were also inconsistent with previous studies, which found that cognitive capacity, risk perception, and institutional trust (among others) predicted systematic processing (Ryu & Kim, 2014; Trumbo, 2002). Therefore, the findings are partly in line with prior research, but not all predictors correlated with the outcome variables.

A probable reason why the predictors significantly correlated with the ability to distinguish correctly between real and fake news and/or systematic processing, but did not significantly predict the outcome variables in the regression model, is that the predictors correlated with each other. When multiple predictors were included, the overall prediction did not improve much. Hence, the effect of the predictors may have diminished and become nonsignificant. Future research should examine why multiple predictors did not significantly predict the outcome variables in the regression models.

Gender Differences

Significant differences were found between female and male respondents. For females but not males, systematic processing and risk perception regarding COVID-19 were (moderately) significantly correlated with the ability to distinguish correctly between real and fake news. In addition, for females but not males, risk perception (regarding both COVID-19 and the vaccine) and institutional trust were significantly correlated with systematic processing. Furthermore, risk perception regarding COVID-19 significantly predicted systematic processing in a regression model for males but not females. The male sample was limited, with only 68 respondents. Therefore, the findings should be interpreted with caution.

How the gender differences arose was beyond the scope of this study, but further research into the gender differences is recommended. Such work could focus on past findings that males are overconfident (Lundeberg et al., 1994; Barber & Odean, 2001) and perceive fewer risks than females do (Dryhurst et al., 2020; Lundborg & Andersson, 2008; Olofsson & Rashid, 2011). These aspects may have led to over- or underestimated self-reported ratings.

Strengths

This study has several strengths. First, this study analysed via a single model whether systematic processing, cognitive capacity, risk perception (regarding both vaccines and COVID-19), and institutional trust predicted the ability to distinguish correctly between real and fake news. Moreover, this study analysed the indirect effect of systematic processing between the predictors and the ability to distinguish correctly between real and fake news. To my knowledge, previous studies have not analysed these variables in a similar manner. Therefore, this study increased the understanding of why some people are better than others at distinguishing correctly between real and fake news. This knowledge can help risk communicators to design effective interventions and reduce the negative effects of fake news.

Second, previous studies have measured the ability to distinguish correctly between real and fake news by showing participants headlines with images, or by displaying statements, and asking respondents to indicate whether it was real or fake news. To my knowledge, this study is the first to comprehensively and systematically evaluate the ability to distinguish correctly between real and fake news by presenting entire news items. The news items included social media messages and entire news articles from real and fake news sources. These news items were systematically measured using the same amount of words, a similar topic, a similar platform, et cetera. This approach is new and better than previous approaches. Respondents were able to read (or scan) through entire news articles and were able to form opinions on more than just a title. This is comparable to real life where people

encounter and, in most cases, scan whole (fake) news articles or social media messages (Cutrell & Guan, 2007; Nielsen, 1997). Hence, this study lays the foundation for future research in the field of fake news by providing an effective method for measuring a person's ability to distinguish correctly between real and fake news.

Third, to my knowledge, this study is the first to identify individual characteristics of Dutch people that determined the extent to which the participants distinguished correctly between real and fake news. This is relevant to the Dutch population specifically. Countries with different cultures and social media habits are not necessarily similar to the Netherlands.

Finally, this study created new scales for all variables used in the current research. Items were adapted and combined from previous studies for this purpose. This approach was necessary because the topics (COVID-19, the vaccine, and fake news) were not addressed by existing scales. Future studies and similar research can use the scales created here.

Limitations and Considerations for Future Research

The limitations of the study are discussed in this section. First, the study was correlational, as it did not aim to provide directions for the relationships between the variables. Hence, it is unknown whether the ability to distinguish correctly between real and fake news predicted that people would have high institutional trust, or vice versa. In addition, confounding variables may have influenced the results. For example, the correlation between institutional trust and the ability to distinguish correctly between real and fake news could have been diminished had a variable such as educational level been included in the model. Future studies should use another research design, probably experimental, to determine the causality between the variables while controlling for confounding variables.

Second, the questionnaire had limitations. To prevent the questionnaire from becoming too extensive–which could have led respondents to be unwilling to complete it–the number of items was kept to a minimum. For instance, cognitive capacity has been measured in reputable tests using dozens of questions, whereas this study included only nine items. Using more items could have increased the content validity, as cognitive capacity is a complex theoretical concept. Moreover, most items used were subjective and respondents had the opportunity to search online for correct answers. These characteristics affected the reliability. Future research should, if possible, use objective items, a more complete scale for the measurements, and supervision to improve the content validity and reliability.

Third, it is unknown whether respondents read the news items, scanned through them, or only paid attention to the title. This is important to know, because presenting entire news

items only adds value if they have been read or scanned by participants in their entirety. There are indications that most respondents read or scanned the articles, as the expected amount of time (10 min) spent on the questionnaire was comparable to the actual number of minutes (M = 9.57, SD = 7.22). Nine of the 235 respondents were excluded from this score, as they had completed the questionnaire in more than an hour. Future research should use eye-tracking measures to understand how the (fake) news articles were analysed.

Fourth, this study used a non-probability sampling method. This approach is less optimal than probability sampling. In other words, not all Dutch people had an equal chance to participate in the survey. It is possible that a substantial proportion of respondents were from the eastern part of the Netherlands, as the survey was widely distributed there. In addition, the composition of the sample did not adequately reflect the Dutch population. For example, the average age of the respondents was 10 years younger than the general Dutch population (Central Bureau for Statistics [CBS], 2021c). Nonetheless, the variable of age was not significantly correlated with the ability to distinguish correctly between real and fake news. Hence, the young age of the sample did not appear to be a major limitation.

Moreover, the sample included more than twice as many females as males, whereas the female-male ratio is roughly equal in the Netherlands (CBS, 2021b). Females and males had significantly different results. Thus, the overall findings were affected by gender differences. Had the female-male ratio been equivalent, the overall correlations might have been different. Therefore, this study's results are not generalisable to the entire Dutch population and the findings should generally be interpreted with caution. The similarities between females and males provide however additional support for the overall findings. Future research should use a more representative sample, with a probability based survey, to draw more accurate conclusions.

Fifth, the results are not easily generalisable to other countries. In the Netherlands, most people are active on social media (CBS, 2021a). Countries where people are less active on social media are less affected by fake news, since social media is a major disseminator of fake news (Moravec et al., 2018; Rampersad & Althiyabi, 2019; Wu et al., 2019). This has to do with the familiarity principle. Furthermore, previous studies found that governmental differences and cultural aspects, such as masculinity and collectivism, influenced the extent to which people distinguished correctly between real and fake news (Rampersad & Althiyabi, 2019). Thus, it is assumed that this study's results are only generalisable to countries with similar cultures and similar social media usage. Future research should explore the extent to which countries with less or more social media usage, and countries with diverse cultures,

yield different findings.

Sixth, the findings of this study are difficult to generalise to other fake news topics. Some studies found that people who believed one fake news topic were likely to believe others too (Goertzel, 1994; Boudry & Braeckman, 2011, as cited in Douglas et al., 2019), even when the topics were unrelated (Wood et al., 2012). The psychological characteristics of fake news messages, which affect people's ability to distinguish correctly between real and fake news, occur across topics (Wood et al., 2012; Goertzel, 1994). However, these psychological characteristics are expected to be influenced more by fake news with a crisis topic than a political one. Fake news with a crisis topic is expected to evoke more fear, as it influences individuals directly. This leads to a higher frequency of rumours, and a stronger belief in fake news (Pennycook & Rand, 2021; Kim & Kim, 2020). Moreover, the volume of fake news on a specific topic can affect the results through the familiarity principle. Familiarity makes it difficult to distinguish correctly between real and fake news (Pennycook & Rand, 2021; Dechêne et al., 2009). Hence, the findings of this study are only generalisable to other fake news topics with a crisis character, and a similar volume of fake news.

Lastly, other individual characteristics which were not considered in this study may have predicted why people were able to distinguish correctly between real and fake news. The regression model containing systematic processing, cognitive capacity, risk perception regarding both COVID-19 and the vaccine, and institutional trust explained 27% of the variance in the ability to distinguish correctly between real and fake news. Other predictors might have contributed to the prediction of the ability to distinguish correctly between real and fake news. For example, according to Bronstein et al. (2018), delusion-prone individuals, dogmatic individuals, and religious fundamentalists are relatively likely to believe fake news. Guess et al. (2020) found online illiteracy to be an important predictor of being able to distinguish correctly between real and fake news. Similarly, Preston et al. (2021) stated that emotional intelligence influences risk perception, decision-making, and judgement formation and may have influenced the ability to distinguish correctly between real and fake news. Future research should take these and other likely variables into account.

Implications

Both theoretical and practical implications can be drawn from this study. Several individual characteristics, which previous studies have shown to be important, were analysed to determine whether they predicted the ability to distinguish correctly between real and fake news. The results offer new insights regarding the existing literature. Based on current

findings, cognitive capacity can be ruled out as a key individual characteristic that predicts the ability to distinguish correctly between real and fake news. Furthermore, contrary to previous studies, risk perception regarding COVID-19 and institutional trust correlated positively with the ability to distinguish correctly between real and fake news. Hence, this study minimised the amount of individual characteristics that predict the ability to distinguish correctly between real and fake news. Also, it provided new perspectives on the variables of "risk perception regarding COVID-19" and "institutional trust" in relationship with the ability to distinguish between real and fake news. This information can be used as a basis for future research.

The practical implication of this study is that it provides valuable insights for risk communicators to reduce the impact of fake news. The results shed light on a susceptible group that needs extra protection, namely people who

- process information unsystematically
- have low risk perception regarding COVID-19
- have low institutional trust
- have high risk perception regarding the vaccine

These people are vulnerable to the threats posed by the presence of fake news. They can be assisted with interventions, for example, a short awareness training on "how to interpret and read a news article and how to detect fake news" to increase their ability to distinguish correctly between real and fake news (Moravec et al., 2018; Lutzke et al., 2019). Hence, this study can help to reduce the negative effects of fake news by identifying the most susceptible audience.

Conclusion

In conclusion, this study investigated which individual characteristics influence whether a person can distinguish correctly between real and fake news related to COVID-19. The current research integrated the main predictors of the ability to distinguish correctly between real and fake news into a single model, whereby the indirect effects of the processing style were assessed. Moreover, the ability to distinguish correctly between real and fake news was evaluated in a systematic manner, using social media messages and entire news articles. The sample consisted of Dutch individuals since previous studies were not generalisable to the Netherlands because of cultural differences and differences in social media usage.

The results showed that systematic processing, risk perception regarding the COVID-

19 vaccine, risk perception regarding the virus itself, and institutional trust were individual characteristics that predicted the ability to distinguish correctly between real and fake news. Hereby, systematic processing had a mediating role between risk perception regarding COVID-19 and the ability to distinguish correctly between real and fake news.

Further research–probably experimental–on the topic of COVID-19 and the vaccine is needed to understand the causality of the relationship between the independent and dependent variables. Confounding variables should be controlled for. Future studies should use probability sampling to obtain a more representative sample, and the variables should be measured with a more complete scale of objective items. In addition, future research is needed to explore the unexpected findings of this study. Lastly, future research should focus on additional individual characteristics, to understand better which people struggle to distinguish correctly between real and fake news. Overall, the findings from this study could help to reduce the impact of fake news by identifying relevant target groups for interventions.

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Appendix A

Questionnaire

Start van blok: Intro

Q1 Beste deelnemer,

Je bent uitgenodigd om deel te nemen aan het onderzoek genaamd “The human fact-checker: factors that lead to different interpretations of COVID-19 news”. Dit onderzoek wordt uitgevoerd door Marco Groothuis van de faculteit Behavioural, Management and Social Sciences, toebehorend aan Universiteit Twente.

Het doel van dit onderzoek is om te analyseren hoe mensen COVID-19 gerelateerde nieuwsberichten interpreteren, en welke factoren deze interpretatie verklaren. Hierdoor ontstaat er meer kennis, dat helpt om nieuwsberichten en het bijbehorende gedrag van mensen beter te begrijpen. Zodoende kunnen mensen beter geïnformeerd worden door middel van optimale nieuwsberichten. Het invullen van de enquête kost ongeveer 10 minuten. De gegevens (jouw antwoorden en de antwoorden van de overige respondenten) worden gebruikt om de factoren in kaart te brengen die van invloed zijn op de interpretatie van COVID-19 nieuwsberichten.

Je deelname aan dit onderzoek is geheel vrijwillig en je kunt elk moment stoppen. Ook is het mogelijk om vragen onbeantwoord te laten.

Ik ben van mening dat er geen bekende risico's verbonden zijn aan dit onderzoek met uitzondering van het tonen van nieuwsberichten. Deze nieuwsberichten komen van verscheidene bronnen die verschillen in het perspectief over COVID-19. Daarom wordt er aan het einde van deze enquête meer informatie gegeven over deze nieuwsberichten. Bovendien is, zoals bij elk online onderzoek, het risico van inbreuk in gegevens mogelijk. Je antwoorden in dit onderzoek blijven naar mijn beste vermogen vertrouwelijk. Eventuele risico’s zijn geminimaliseerd door de gegevens op een laptop te bewaren met beveiligingsmaatregelen (firewall, code toegang, et cetera). Bovendien is de link die naar het online platform leidt geanonimiseerd. Ook worden er geen persoonlijke gegevens geregistreerd waardoor deelname niet naar jou kan worden herleid.

Als je meer informatie wilt over de enquête, of over de wijze hoe er gebruik wordt gemaakt van de door jou gegeven antwoorden, dan kun je door middel van de onderstaande gegevens contact met mij opnemen.

[Marco Groothuis, m.g.f.groothuis@student.utwente.nl, +31657540617]

Als de onderstaande vereisten op jou van toepassing zijn, en als je bereid bent om deel te nemen aan dit onderzoek, dan mag je het vakje “Ik geef toestemming” aanvinken.

• Ik ben 16 jaar of ouder;
• Ik ben in staat om zelfstandig keuzes te maken over voorgesteld gedrag;
• Ik ben mij bewust van de risico’s en de voordelen van dit onderzoek;
• Ik begrijp dat mijn toestemming vrijwillig en voortdurend is;
• Ik begrijp dat mijn toestemming op elk moment kan worden ingetrokken zonder opgaaf van reden.

Alvast bedankt voor het willen invullen van mijn onderzoek!

- ○ Ik geef toestemming (1)
- ○ Ik geef geen toestemming (2)

Ga naar: Einde enquête Als Q1 = Ik geef geen toestemming

Einde blok: Intro

Start van blok: Demografische kenmerken

Q2 Wil je hier je leeftijd invullen?

_____

Q3 Wil je hier je geslacht invullen?

- Man (1)
- Vrouw (2)
- Niet-binair/derde geslacht (3)
- Zeg ik liever niet (4)

Q4 Wil je hier je hoogst genoten opleiding invullen?

- Voorbereidend middelbaar beroepsonderwijs (vmbo) (1)
- Hoger algemeen voortgezet onderwijs (havo) (2)
- Voorbereidend wetenschappelijk onderwijs (vwo) (3)
- Middelbaar beroepsonderwijs (mbo) (4)
- Hoger beroepsonderwijs (hbo) (5)
- Wetenschappelijk onderwijs (wo) (6)

Q5 Wil je hier invullen of je besmet bent (geweest) met COVID-19?

- Nee, ik ben niet besmet (geweest) met COVID-19 (1)
- Ik weet niet of ik besmet ben (geweest) met COVID-19 (2)
- Ja, ik ben besmet (geweest) met COVID-19 (3)
- Zeg ik liever niet (4)

Q6 Wil je hier invullen of je gevaccineerd bent tegen COVID-19?

- Ja, ik ben volledig gevaccineerd en ik heb inmiddels ook het boostervaccin gehad (1)
- Ja, ik ben volledig gevaccineerd (2)
- Ja, maar slechts gedeeltelijk (3)
- Nee, nog niet (4)
- Nee, ik laat me niet vaccineren (5)
- Zeg ik liever niet (6)

Einde blok: Demografische kenmerken

Start van blok: Nieuwsberichten

Q7 Hoe denk jij over de onderstaande nieuwsberichten? Wil je aangeven welke nieuwsberichten jij beschouwt als echt nieuws en/of nep nieuws?

7.1

Het bovenstaande nieuwsbericht beschouw ik als ...

- ○ Echt nieuws (1)
- ○ Nep nieuws (2)
- ○ Ik weet het niet (3)

Q7.2

Het bovenstaande nieuwsbericht beschouw ik als ...

- ○ Echt nieuws (1)
- ○ Nep nieuws (2)
- ○ Ik weet het niet (3)

Q7.3

Het bovenstaande nieuwsbericht beschouw ik als ...

- ○ Echt nieuws (1)
- ○ Nep nieuws (2)
- ○ Ik weet het niet (3)

Q7.4

Het bovenstaande nieuwsbericht beschouw ik als ...

- ○ Echt nieuws (1)
- ○ Nep nieuws (2)
- ○ Ik weet het niet (3)

Q7.5

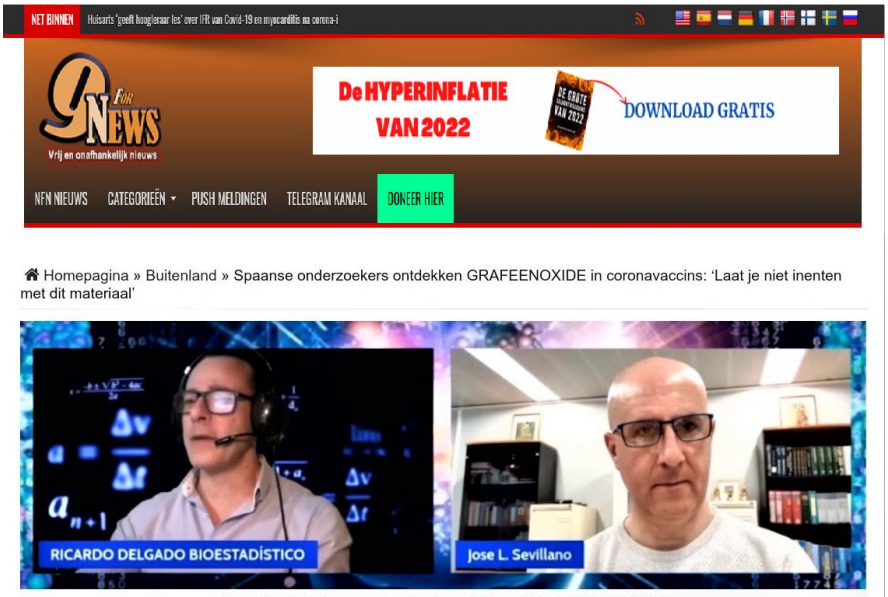

Foto: Ricardo Delgado en Jose Sevillano (Videostill Rumble/ORWELLITO)

Spaanse onderzoekers ontdekken GRAFEENOXIDE in coronavaccins: 'Laat je niet inenten met dit materiaal'

in Buitenland 1 juli 2021 13:30 88 Reacties

Een team Spaanse onderzoekers en professoren onder leiding van biostatisticus Ricardo Delgado en dr. José Sevillano heeft het coronavaccin onder de loep genomen. De onderzoekers legden het goedje onder een zogeheten transmissie-elektronenmicroscoop (TEM). De uitkomsten waren zorgwekkend. De vaccins bleken voor een groot deel uit grafeenoxide te bestaan.

Onder geen beding

Deze nanodeeltjes grafeen zijn giftig. Ze veroorzaken bloedstolsels en sterfte. Daarnaast kan grafeenoxide een instorting van het immuunsysteem en vervolgens een cytokinestorm veroorzaken, aldus de groep.

De experts die de analyse hebben uitgevoerd, hebben maandag een voorlopig rapport gepubliceerd over hun bevindingen, dat hier kan worden bekeken. Het rapport is opgesteld door professor Pablo Campra Madrid van de Universiteit van Almeria in Spanje.

"houd je kinderen, jezelf en je familieleden uit de buurt van dit materiaal," waarschuwde Delgado. "laat jezelf onder geen beding inenten met grafeenoxide, want dat is wat er in het vaccin zit."

Gemerkt als vee

Sevillano voegde toe dat we koste wat kost moeten voorkomen dat wij en toekomstige generaties worden gemerkt als vee en ziek kunnen worden. Delgado zei nog dat de Duits-Amerikaanse advocaat Reiner Fuellmich is geïnformeerd over het onderzoek.

OVER ROBIN DE BOER

Robin de Boer (1983) heeft Economische Geografie gestudeerd aan de Rijksuniversiteit Groningen. Hij is sinds juni 2014 werkzaam als hoofdredacteur van NineForNews.

Het bovenstaande nieuwsbericht beschouw ik als ...

- ○ Echt nieuws (1)
- ○ Nep nieuws (2)
- ○ Ik weet het niet (3)

Q7.6

Ziekteverwekkende antilichamen? Vaccin-geïnduceerde antilichamen worden nu verondersteld catastrofaal te zijn voor gezond weefsel

september 4, 2021 6817 2

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Een studie van wetenschappers in Hangzhou, onthult dat de antilichamen die zich richten tegen het spike-eiwit van Covid-19 zich keren tegen het immuunsysteem van gevaccineerden, dit is geëvalueerd voor de Covid-19 vaccins - Moderna, Pfizer en J&J. De aanval wordt niet alleen door het vaccin in gang gezet, maar ook door het virus. Ofwel, als je het Covid-19 vaccin krijgt, krijg je nog steeds Covid, en zowel de prik als het virus zorgen ervoor dat de nieuw geïnjecteerde spike-eiwit antilichamen je eigen lichaamsweefsels aanvallen en vernietigen, inclusief vitale organen die je nodig hebt om te overleven en om infecties te bestrijden.

Dit is wat er gebeurt als u de fatale Covid-19 prik krijgt. Door een ziekteverwekkend virus worden antilichamen aangemaakt die zich binden aan uw longcellen, zowel de beschadigde als de gezonde. Deze antilichamen die zich binden aan longcellen kunnen auto-immuunschade veroorzaken, en twee van de door de Chinese onderzoekers geteste antilichamen binden zich sterk aan zowel gezonde als beschadigde cellen. Weten artsen dit? Nee. Worden mensen die Covid-vaccinaties krijgen hiervoor gewaarschuwd? Nee. De mainstream media zullen dit volledig uit het nieuws weren.

De CDC, en andere talking heads aan de top van het industriële complex van vaccins, herhalen dezelfde leugenachtige mantra over "veilige en effectieve" vaccins, maar de wetenschap onthult dat onderzoekers al lang weten hoe bepaalde eiwitten waar onze antilichamen zich op vastzetten, kunnen worden gevonden in onze eigen cellen, in plaats van het virus.

Antilichamen kunnen voor de gek worden gehouden door cellen die op onze natuurlijke cellen lijken of deze nabootsen. De enige echt "veilige en effectieve" vaccins zijn vaccins die de ziekteverwekkers doden zonder zich aan de weefsels van uw lichaam te binden. Dat zien we niet bij de Covid-vaccins. De spike-eiwitten verstoppen de bloedvaten en dringen de organen binnen, terwijl de mRNA-technologie uw cellen opdraagt er steeds meer te maken.

Het spike-eiwit is niet ongevaarlijk. De fabrikanten van het Covid-vaccin willen doen geloven dat dit slechts onschadelijke kleine fragmenten zijn die het lichaam ertoe aanzetter antilichamen te maken die klaar staan om het SARS-CoV-2-virus aan te vallen en te doden, maar dat is een leugen. Artsen komen erachter dat er miljarden spike-eiwitten in het bloed van patiënten zitten als gevolg van Covid-prikken. Onderzoekers publiceerde onlangs een studie in het vaktijdschrift Circulation Research en onthulde dat spike-eiwitten schade kunnen toebrengen aan de endotheelcellen die de binnenbekleding vormen van bloedvaten.

Meest recente berichten

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De militarisering van de Coronacrisis rukt op in Europa

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Frontnieuws april 13, 2021

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Een nieuwe studie toont aan dat de klimaatverandering niet schadelijk is...

juni 4, 2018

Dr. Lee Merritt: Als je denkt dat je tegen een virus...

september 27, 2021

Ambassadeur gedwongen ontslag te nemen – vergeleek Merkel met Hitler

mei 11, 2020

Ooggetuigenverslag van een intensive care arts: "Dood na een COVID-19 vaccinatie"

april 12, 2021

Populair laatste 7 dagen

Advocaat Reiner Fuellmich over Neurenberg 2.0: Gerechtigheid zal niet komen via...

Frontnieuws december 8, 2021

Dr. Reiner Fuellmich is advocaat in Duitsland en in Californië, en hij heeft door middel van zijn Corona Onderzoekscommissie in de afgelopen twee jaar...

DE HOLOCAUST KEERT TERUG: EU wil de code van Neurenberg afschaffen,...

december 8, 2021

De wereld is gek geworden: Het COVID Vaccin Krankzinnigheid Syndroom

december 8, 2021

Druk van de bevolking te groot: Australische deelstaat wil verplichte vaccinatie...

december 3, 2021

De ware bedoeling achter de krankzinnige poging om elk kind ter...

december 7, 2021

Het bovenstaande nieuwsbericht beschouw ik als ...

Het bovenstaande nieuwsbericht beschouw ik als ...

- ○ Echt nieuws (1)
- ○ Nep nieuws (2)
- ○ Ik weet het niet (3)

Q7.7

VS stellen bijsluiter Pfizer en Moderna bij na hartspierontstekingen

28/06/2021 om 16:44 door Dorien Colman | Bron: Reuters, Belga

Foto: Reuters

De Amerikaanse geneesmiddelenautoriteit FDA vermoedt een verband tussen het covid-vaccin van Pfizer en het risico op een ontstoken hartspier of hartzakje, vooral bij jonge mannen. Ze breidt de bijsluiter daarom uit met een waarschuwing.

Het Amerikaanse geneesmiddelenagentschap FDA heeft een waarschuwing voor het risico op zeldzame hartontstekingen toegevoegd aan de bijsluiter van de coronavaccins van Pfizer en Moderna

'Vaccineer iedereen boven de 12 jaar'

De waarschuwing komt er nadat de Amerikaanse centra voor ziektepreventie (CDC) 393 gevallen hebben geregistreerd én bevestigd hebben gezien bij mensen jonger dan 30 die een Pfizer- of Modernavaccin hadden gekregen. Dat is meer dan voorspeld zonder vaccinatie. Het aantal gevallen ligt opmerkelijk hoger bij mannen, en in de week na de toediening van de tweede dosis.

De mogelijke bijwerking is erg zeldzaam. Voorlopige data wijzen op een incidentie van 12,6 op 1 miljoen. De CDC houden dan ook vast aan hun aanbeveling om iedereen ouder dan 12 jaar te vaccineren.

Niet genoeg gegevens

Het Europese Geneesmiddelenagentschap EMA bekijkt 122 gevallen van myocarditis en 126 gevallen van pericarditis die gemeld zijn voor eind mei.

Het agentschap blijft de zaak onderzoeken, maar heeft voorlopig nog niet genoeg gegevens om te kunnen bepalen of er een verband is met het vaccin. Het beoordeelt de kans op schade door een coronabesmetting ook in deze leeftijdsgroep als (veel) groter dan de kans op ernstige bijwerkingen en volgt daarmee de aanbeveling van de CDC.

Mis geen enkele update over de coronacrisis
Download de app DS Nieuws ›

Als eerste op de hoogte van binnenlands nieuws?

Schrijf u in op onze nieuwsbrief en ontvang iedere middag betrouwbare nieuwsupdates.

INSCHRIJVEN ›

Wees gerust! U kan altijd uitschrijven met één klik. Lees hier ons privacybeleid.


⊞ Het Afrikaanse covid-vaccin komt eraan

⊞ Het scenario van een film


⊞ New York laat zien hoe het moet

⊞ EMA: 'Boosterprik na drie maanden veilig en effectief'


⊞ Het Afrikaanse covidvaccin komt eraan


VRT interviewde coronabetogers met anonieme micro's


⊞ Omikron stuurt farma terug naar tekentafel


⊞ VRT interviewde coronabetogers met anonieme micro's


⊞ Leeuw organiseert zelf boosterprik voor leerkrachten en kinderverzorgers


⊞ Omikronvariant omzeilt bescherming van huidige vaccins

Het bovenstaande nieuwsbericht beschouw ik als ...
Het bovenstaande nieuwsbericht beschouw ik als ...

- ○ Echt nieuws (1)
- ○ Nep nieuws (2)
- ○ Ik weet het niet (3)

Q7.8 Wat heeft ertoe geleid om sommige nieuwsberichten als echt nieuws te beschouwen en andere nieuwsberichten als nep nieuws?

_____

_____

_____

_____

_____

Einde blok: Nieuwsberichten

Start van blok: Competenties

Q8 In hoeverre zijn de volgende competenties van toepassing op jou? Wil je aangeven in hoeverre je het met de volgende stellingen eens bent?

	Helemaal niet mee eens (1)	Enigszins mee oneens (2)	Noch eens noch oneens (3)	Enigszins mee eens (4)	Helemaal mee eens (5)
Ik zou mijn algemene ontwikkeling beschrijven als goed (1)	○	○	○	○	○
Ik ben goed in het creatief (out of the box) denken om nieuwe problemen op te lossen (2)	○	○	○	○	○
Als iemand een complex verhaal vertelt, dan begrijp ik meestal precies wat ermee wordt bedoeld (3)	○	○	○	○	○
Ik ben goed in het oplossen van hersenkrakers (4)	○	○	○	○	○
Bij het lezen van informatieve stukken tekst begrijp ik meestal precies wat ermee wordt bedoeld (5)	○	○	○	○	○
Ik ben goed in het verwoorden van mijn argumenten tijdens discussies (6)	○	○	○	○	○
Ik ben goed in het onthouden van nieuwe informatie (7)	○	○	○	○	○
Bij het schrijven van teksten ben ik goed in staat om mezelf grammaticaal correct te verwoorden (8)	○	○	○	○	○
Ik ben goed in het herkennen van patronen (9)	○	○	○	○	○

Ik zou mijn kennis met betrekking tot COVID-19 informatie beschrijven als ruim voldoende (10)	○	○	○	○	○

Einde blok: Competenties

Start van blok: Overheidsinstanties

Q9 Hoe denk jij over het beleid van Nederlandse overheidsinstanties met betrekking tot COVID-19. Wil je aangeven in hoeverre je het met de volgende stellingen eens bent?

	Helemaal niet mee eens (1)	Enigszins mee oneens (2)	Noch eens noch oneens (3)	Enigszins mee eens (4)	Helemaal mee eens (5)
Van Nederlandse overheidsinstanties kan worden vertrouwd dat ze doen wat juist is met betrekking tot COVID-19 (1)	○	○	○	○	○
Medewerkers die de overheidsinstanties leiden, en belangrijke beslissingen nemen over COVID-19 onderwerpen, zijn deskundige mensen (2)	○	○	○	○	○
Overheidsinstanties worden voornamelijk bestuurd door een kleine groep mensen die niet in het voordeel van Nederlanders handelen, maar in hun eigen belang (3)	○	○	○	○	○
Nederlandse overheidsinstanties hebben in het verleden laten zien dat ze goed met grote crises, zoals een virusuitbraak, om kunnen gaan (4)	○	○	○	○	○

Einde blok: Overheidsinstanties

Start van blok: Risico's

Q10 Hoe denk jij over de risico's van COVID-19? Wil je aangeven in hoeverre je het met de volgende stellingen eens bent?

	Helemaal niet mee eens (1)	Enigszins mee oneens (2)	Noch eens noch oneens (3)	Enigszins mee eens (4)	Helemaal mee eens (5)
De **kans** is groot dat ik het COVID-19 virus (opnieuw) zal oplopen (1)	○	○	○	○	○
Het COVID-19 virus kan grote negatieve **effecten** hebben op mijn gezondheid (2)	○	○	○	○	○
De **kans** is groot dat de "gemiddelde Nederlander" (opnieuw) besmet raakt met het COVID-19 virus (3)	○	○	○	○	○
Het COVID-19 virus kan grote negatieve **effecten** hebben op de gezondheid van de "gemiddelde Nederlander" (4)	○	○	○	○	○

Q11 Hoe denk jij over de risico’s van het vaccin tegen COVID-19? Wil je aangeven in hoeverre je het met de volgende stellingen eens bent?

	Helemaal niet mee eens (1)	Enigszins mee oneens (2)	Noch eens noch oneens (3)	Enigszins mee eens (4)	Helemaal mee eens (5)
De **kans** is groot dat het COVID-19 vaccin negatieve effecten heeft op mijn gezondheid (1)	○	○	○	○	○
Het COVID-19 vaccin kan grote negatieve **effecten** hebben op mijn gezondheid (2)	○	○	○	○	○
De **kans** is groot dat het COVID-19 vaccin negatieve effecten heeft op de gezondheid van de “gemiddelde Nederlander” (3)	○	○	○	○	○
Het COVID-19 vaccin kan grote negatieve **effecten** hebben op de gezondheid van de “gemiddelde Nederlander” (4)	○	○	○	○	○

Einde blok: Risico's

Start van blok: Informatie

Q12 Hoe beoordeel jij nieuwsberichten over COVID-19? Wil je aangeven in hoeverre je het met de volgende stellingen eens bent?

	Helemaal niet mee eens (1)	Enigszins mee oneens (2)	Noch eens noch oneens (3)	Enigszins mee eens (4)	Helemaal mee eens (5)
Wanneer ik informatie over COVID-19 tegenkom, concentreer ik me slechts op enkele belangrijke punten (1)	○	○	○	○	○
Ik leg verbanden tussen nieuw verkregen COVID-19 informatie, en COVID-19 informatie die ik elders heb verkregen (2)	○	○	○	○	○
Nadat ik informatie over COVID-19 tegenkom, zal ik over deze informatie nadenken, zodat ik acties kan overwegen om mezelf en mijn familie te beschermen (3)	○	○	○	○	○
Als ik mezelf en mijn familie moet beschermen tegen COVID-19, wil ik veel standpunten in me opnemen (4)	○	○	○	○	○
Er wordt meer informatie aangeboden over het onderwerp COVID-19, dan ik persoonlijk nodig heb (5)	○	○	○	○	○

Wanneer ik informatie over COVID-19 tegenkom, lees en/of luister ik zoveel mogelijk om de informatie op te slaan, ook al ben ik het niet eens met het standpunt (6)	○	○	○	○	○

Einde blok: Informatie

Start van blok: Eindtekst

Q13 Beste deelnemer,

Je hebt zojuist deelgenomen aan een onderzoek met als doel om te verklaren op welke wijze COVID-19 nieuwsberichten worden geïnterpreteerd, en welke factoren deze interpretatie verklaren. Het was niet mogelijk om specifieke informatie te geven over het doel, aangezien dit je reactie ernstig had kunnen beïnvloeden. Het doel van dit onderzoek is om te analyseren of bepaalde factoren een relatie hebben met het wel of niet kunnen onderscheiden van nep en echt nieuws. De onderzochte factoren zijn: 1. het vertrouwen in overheidsinstanties; 2. de risicoperceptie in relatie tot het COVID-19 virus en het vaccin; 3. de wijze waarop informatie uit nieuwsberichten wordt verwerkt; 4. en specifieke competenties die helpen bij het analyseren van informatie. Dit onderzoek geeft daarom belangrijke inzichten in de factoren die ertoe leiden dat mensen nepnieuws geloven. Zodoende kunnen overheidsorganisaties treffende maatregelen nemen om het steeds groter wordende probleem, “nepnieuws”, te minimaliseren.

Verdere informatie over de getoonde items en nepnieuws.

De getoonde nieuwsberichten zijn afkomstig van verschillende bronnen, namelijk Twitter accounts en nieuwswebsites. De indeling in echte en neppe nieuwsberichten is op basis van fact-checking websites, waaronder AFP en POINTER gecontroleerd.

Verscheidene onderzoeken, waaronder Pennycook en Rand (2021), Dechêne en collega’s (2009) en Vosoughi en collega’s (2018) tonen de punten aan waar nep nieuws zich van echt nieuws onderscheidt. Een verschil tussen echte en neppe nieuwsberichten is het gebrek aan nuance van neppe nieuwsberichten. Echte nieuwsberichten nemen minder stellige standpunten aan, informeren over andere mogelijke oorzaken, en noemen gebreken van gegeven informatie. Neppe nieuwsberichten zijn daarentegen bezig met het creëren van angst en hechten geen waarde aan het geven van volledige informatie. Verder proberen zowel echte als neppe nieuwsbronnen over te komen als betrouwbaar, bijvoorbeeld door te verwijzen naar onderzoekers bij het beargumenteren van meningen en feiten. Door verder te kijken, is te zien dat neppe nieuwsbronnen vaak gebruik maken van onderzoeken die worden ontkracht door meerdere (wetenschappelijke) bronnen. Ook worden woorden verdraaid en/of weggelaten. Verder proberen nepnieuws bronnen informatie te gebruiken die als herkenbaar kan worden beschouwd. Als je soortgelijke informatie meerdere keren tegenkomt, waarbij de informatie vertrouwd aanvoelt, dan ben je eerder geneigd om dergelijke berichten bewust en onbewust te geloven. Daarom is het controleren van informatie via fact-checking websites, en het volgen van de rijksoverheid tips om desinformatie en nepnieuws te herkennen, zeer hulpvol. Hieronder worden de 7 gebruikte nieuwsberichten getoond, en wordt erbij vermeld of het echt of nep nieuws is.

Als je verdere vragen hebt over het onderzoek, of op de hoogte gehouden wilt worden van de resultaten, dan kun je met mij contact opnemen door middel van de onderstaande gegevens.

Marco Groothuis +31657540617 m.g.f.groothuis@student.utwente.nl

Indien deze informatie ertoe heeft geleid om jezelf alsnog terug te willen trekken uit dit onderzoek, dan mag je het vakje “Ik geef geen toestemming” aanvinken. Zodoende zullen de verzamelde anonieme gegevens worden verwijderd.

Nogmaals bedankt voor het invullen van deze enquête!

- ○ Ik geef wel toestemming (1)
- ○ Ik geef geen toestemming (2)

Einde blok: Eindtekst

Appendix B

News Article Similarities

Table B1

Schematic Overview of the Similarities and Differences Between the Fake and True News Items

Content of the item	Item	
	True news	Fake news
Social media message or news articles	Item 1: social media (Twitter) Item 7: news article	Item 2: social media (Twitter) Item 3: social media (Twitter) Item 4: social media (Twitter) Item 5: news article Item 6: news article
Source	Item 1: Newsblad Item 7: Standaard	Item 2: Frontnews Item 3: Ninefornews Item 4: Frontnews Item 5: Ninefornews Item 6: Frontnews
Amount likes/comments /shared	Item 1: 197/47/27 Item 7: N/A	Item 2: 213/60/33 Item 3: 219/50/43 Item 4: 259/66/44 Item 5: N/A Item 6: N/A
Source credibility	All items imitated trustworthy organisations/individuals that appealed to the sender with a high amount of social feedback. The items were not of frequent occurrence compared to mainstream media. Therefore, all items scored medium/high in terms of source credibility	
Amount of pictures	Item 1/7: 1	Item 2/3/4/5/6: 1
Substantiated arguments were in the items retrieved from:	Item 1: Israeli researchers and Belgium cardiologists Item 7: The American drug administration	Item 2: British government; Medicines and Healthcare products Regulatory Agency Item 3: Spanish researchers and professors. Item 4: Japanese Red Cross Item 5: Spanish researchers and professors.

		Item 6: researchers from Hangzhou and international researchers
Familiarity characteristic	All items stated reasonably and similar information to previous outspoken stories, regarding criticism of the vaccine, and included pictures.	
Providing negative information about the vaccine and the corresponding dangers (negativity bias)	Item 1/7: nuanced critiques	Item 2/3/4/5/6: less nuanced, more extreme critiques
Perceived fear (Emotional evocative)	Item 1/7: mediocre level of fear due to the more nuanced critiques and reasonable arguments	Item 2/3/4/5/6/: high level of fear and disgust; whereby mortality and extremely negative effects of vaccines were provided in a novel style of writing
Amount of words	Item 1: 16 Item 7: ±250	Item 2: 15 Item 3: 40 Item 4: 30 Item 5: ±200 Item 6: ±350

Appendix C

Overview Items

Table C1

*Overview of the Variables and Constructs, and the Corresponding Items in the Q*uestionnaire

Variable and construct	Item
Systematic processing	1. When I come across information on COVID-19, I only focus on a few key points (Wanneer ik informatie over COVID-19 tegenkom, concentreer ik me slechts op enkele belangrijke punten). [a]
	2. I make connections between newly obtained COVID-19 information, and COVID-19 information obtained elsewhere (Ik leg verbanden tussen nieuw verkregen COVID-19 informatie, en COVID-19 informatie die ik elders heb verkregen).
	3. When I come across information on COVID-19, I will think about it so that I can consider actions to protect myself and my family (Nadat ik informatie over COVID-19 tegenkom, zal ik over deze informatie nadenken, zodat ik acties kan overwegen om mezelf en mijn familie te beschermen).
	4. When I must protect myself and my family from COVID-19, I want to take in many viewpoints (Als ik mezelf en mijn familie moet beschermen tegen COVID-19, wil ik veel standpunten in me opnemen).
	5. More information is offered on COVID-19 than I personally need (Er wordt meer informatie aangeboden over het onderwerp COVID-19, dan ik persoonlijk nodig heb). [a]
	6. When I come across information on COVID-19, I read and/or listen as much as I can to absorb the information, even if I disagree with the point of view (Wanneer ik informatie over COVID-19 tegenkom, lees en/of luister ik zoveel mogelijk om de informatie op te slaan, ook al ben ik het niet eens met het standpunt).
Cognitive capacity: crystallised intelligence	7. I would describe my general knowledge as good (Ik zou mijn algemene ontwikkeling beschrijven als goed). [a]
	8. When someone tells a complex story, I usually understand exactly what is meant by it (Als iemand een complex verhaal vertelt, dan begrijp ik meestal precies wat ermee wordt bedoeld).
	9. When I read informative pieces of text, I usually understand exactly what is meant by it (Bij het lezen van informatieve stukken tekst begrijp ik meestal precies wat ermee wordt bedoeld).
	10. I am good at articulating my arguments during discussions (Ik ben goed in het verwoorden van mijn argumenten tijdens discussies).
	11. When writing, I can express myself grammatically correctly (Bij het schrijven van teksten ben ik goed in staat om mezelf grammaticaal correct te verwoorden).
Cognitive capacity: fluid intelligence	12. I am good at creative (out of the box) thinking to solve new problems (Ik ben goed in het creatief [out of the box] denken om nieuwe problemen op te lossen). [a]
	13. I am good at solving brain teasers (Ik ben goed in het oplossen van hersenkrakers).

	14. I am good at memorising new information (Ik ben goed in het onthouden van nieuwe informatie).
	15. I am good at recognising patterns (Ik ben goed in het herkennen van patronen).
Risk perception: likelihood COVID-19	16. There's a high probability that I will contract the COVID-19 virus (again) (De kans is groot dat ik het COVID-19 virus [opnieuw] zal oplopen).
	17. There's a high probability that "average Dutch" individuals will contract the COVID-19 virus (again) (De kans is groot dat de "gemiddelde Nederlander" [opnieuw] besmet raakt met het COVID-19 virus).
Risk perception: severity COVID-19	18. The COVID-19 virus can cause major negative effects on my health (Het COVID-19 virus kan grote negatieve effecten hebben op mijn gezondheid).
	19. The COVID-19 virus can cause major negative effects on the health of "average Dutch" individuals (Het COVID-19 virus kan grote negatieve effecten hebben op de gezondheid van de "gemiddelde Nederlander").
Risk perception: likelihood vaccine	20. There is a high probability that the COVID-19 vaccine will have negative effects on my health (De kans is groot dat het COVID-19 vaccin negatieve effecten heeft op mijn gezondheid).
	21. There is a high probability that the COVID-19 vaccine will have negative effects on the health of "average Dutch" individuals (De kans is groot dat het COVID-19 vaccin negatieve effecten heeft op de gezondheid van de "gemiddelde Nederlander").
Risk perception: severity vaccine	22. The COVID-19 vaccine can cause major negative effects on my health (Het COVID-19 vaccin kan grote negatieve effecten hebben op mijn gezondheid).
	23. The COVID-19 vaccine can cause major negative effects on the health of "average Dutch" individuals (Het COVID-19 vaccin kan grote negatieve effecten hebben op de gezondheid van de "gemiddelde Nederlander").
Institutional trust: similarity of values	24. Dutch governmental institutions can be trusted to do what is right regarding COVID-19 (Van Nederlandse overheidsinstanties kan worden vertrouwd dat ze doen wat juist is met betrekking tot COVID-19).
	25. Governmental institutions are mainly run by a small group of individuals acting in their own interests (Overheidsinstanties worden voornamelijk bestuurd door een kleine groep mensen die niet in het voordeel van Nederlanders handelen, maar in hun eigen belang).
Institutional trust: confidence	26. Individuals who lead governmental agencies, and make key decisions concerning COVID-19, are competent (Medewerkers die de overheidsinstanties leiden, en belangrijke beslissingen nemen over COVID-19 onderwerpen, zijn deskundige mensen).
	27. Dutch governmental agencies have shown in the past that they can manage major crises, such as a virus outbreak, well (Nederlandse overheidsinstanties hebben in het verleden laten zien dat ze goed met grote crises, zoals een virusuitbraak, om kunnen gaan).

Note. The original items were in Dutch. All items were measured via a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

[a] The item was removed during the factor analysis.

Appendix D

Analyses for Males and Females

Analyses for Males

For males, systematic processing, $r(66) = .06$, $p = .328$, cognitive capacity, $r(66) = .04$, $p = .378$, and risk perception regarding COVID-19, $r(66) = .07$, $p = .287$, were not significantly correlated with the ability to distinguish correctly between real and fake news (see Table D1). A significant and negative correlation was found between risk perception regarding vaccines and the ability to distinguish correctly between real and fake news, $r(66) = -.47$, $p < .001$. Institutional trust was significantly and positively correlated with the ability to distinguish correctly between real and fake news, $r(66) = .43$, $p < .001$. Thus, the lower the risk perception regarding the vaccine, and the higher the institutional trust, the more the person was able to distinguish correctly between real and fake news.

Hence, no support was found for hypotheses 1 and 2a, as systematic processing and cognitive capacity were not significantly correlated with the ability to distinguish correctly between real and fake news. Partial support was found for hypothesis 3a. Risk perception regarding vaccines was consistent with hypothesis 3a, as this variable was significantly and negatively correlated with the ability to distinguish correctly between real and fake news. However, risk perception regarding COVID-19 was not significantly correlated with the ability to distinguish correctly between real and fake news. Lastly, hypothesis 4a was rejected. Institutional trust was significantly and positively correlated with the ability to distinguish correctly between real and fake news, whereas a significant negative correlation would have been consistent with the hypothesis.

Furthermore, there was a significant positive correlation between systematic processing and cognitive capacity, $r(66) = .36$, $p = .001$. Thus, the higher the cognitive capacity, the higher the systematic processing was. Risk perception regarding COVID-19, $r(66) = .15$, $p = .107$, risk perception regarding the vaccine, $r(66) = -.12$, $p = .173$, and institutional trust, $r(66) = .10$, $p = .205$ were not significantly correlated with systematic processing. Hence, the results supported hypothesis 2b since cognitive capacity was significantly and positively correlated with systematic processing. Hypotheses 3b and 4b were rejected. Risk perception regarding the vaccine, risk perception regarding COVID-19, and institutional trust were not significantly correlated with systematic processing.

Table D1

Descriptive Statistics and Correlations of the Variables of Males

Variable	*M*	*SD*	1	2	3	4	5	6	7
1. The ability to distinguish correctly between real and fake news [a]	4.69	1.88	-						
2. Systematic processing [b]	3.83	0.70	.06	-				-	
3. Cognitive capacity [b]	4.06	0.58	.04	.36**	-				
4. Risk perception COVID-19 [b]	3.47	0.81	.07	.15	-.18†	-			
5. Risk perception vaccine [b]	2.35	1.02	-.47***	-.12	.05	-.17†	-		
6. Institutional trust [b]	3.08	0.62	.43***	.10	.06	.20*	-.50***	-	
7. Age	33.29	13.39	.01	.09	.22*	.16†	-.04	.11	-

Note. $N = 68$.

[a] The variable was measured by the number of correct answers in distinguishing between real and fake news, ranging from 0 (no correct answers) to 7 (all correct answers).

[b] The variable was measured via a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

†$p < .10$ (one-tailed). *$p < .05$ (one-tailed). **$p < .01$ (one-tailed). ***$p < .001$ (one-tailed).

Regression Analysis

Table D2 shows that the ability to distinguish correctly between real and fake news was significantly predicted in the regression model by systematic processing, cognitive capacity, risk perception regarding COVID-19, risk perception regarding the vaccine, and institutional trust, $F(5, 62) = 4.65$, $p = .001$, $R^2 = .27$. Risk perception regarding vaccines contributed significantly and negatively to the prediction of the ability to distinguish correctly between real and fake news, $\beta = -.34$, $t(62) = -2.69$, $p = .009$. Institutional trust contributed significantly and positively to the prediction of the ability to distinguish correctly between real and fake news, $\beta = .27$, $t(62) = 2.09$, $p = .041$. Thus, the ability to distinguish correctly between real and fake news increased when risk perception regarding the vaccine decreased and institutional trust increased. Systematic processing, cognitive capacity, and risk perception regarding COVID-19 were not significant predictors in the model.

Table D2

Linear Model of Predictors of the Ability to Distinguish Correctly Between Real and Fake News of Males

Variable	β	*SE*	*B*	*t*(62)	95% CI		*p*	VIF
					LL	*UL*		

Constant		2.28	3.40	1.49	-1.15	7.96	.140	
Systematic processing	-.02	0.32	-0.06	-0.18	-0.70	0.58	.855	1.23
Cognitive capacity	.04	0.39	0.14	0.35	-0.64	0.92	.726	1.24
Risk perception COVID-19	-.03	0.27	-0.07	-0.27	-0.61	0.47	.792	1.14
Risk perception vaccine	**-.34**	0.23	-0.63	-2.69	-1.09	-0.16	.009	1.37
Institutional trust	**.27**	0.39	0.81	2.09	0.04	1.58	.041	1.39

Note. N = 68. CI = confidence interval; *LL* = lower limit, *UL* = upper limit. R^2 = .27. Significant beta coefficients appear in bold.

Table D3 shows that systematic processing was significantly predicted in the regression model by the following variables: cognitive capacity, risk perception regarding COVID-19, risk perception regarding the vaccine, and institutional trust, $F(4, 63) = 3.56$, $p = .011$, $R^2 = .18$. Cognitive capacity contributed significantly and positively to the prediction of systematic processing, $\beta = .40$, $t(63) = 3.43$, $p = .001$. Risk perception regarding COVID-19 contributed marginally significantly and positively to the prediction of systematic processing, $\beta = .21$, $t(63) = 1.75$, $p = .084$. Thus, systematic processing increased when cognitive capacity and risk perception regarding COVID-19 increased. Risk perception regarding the vaccine and institutional trust were not significant predictors in the model.

Table D3

Linear Model of Predictors of Systematic Processing of Males

Variable	β	*SE*	*B*	*t*(63)	95% CI		*p*	VIF
					LL	*UL*		
Constant		0.88	1.50	1.72	-0.25	3.25	.091	
Cognitive capacity	**.40**	0.14	0.48	3.43	0.20	0.76	.001	1.05
Risk perception COVID-19	**.21**[†]	0.10	0.18	1.75	-0.03	0.39	.084	1.09
Risk perception vaccine	-.11	0.09	-0.08	-0.85	-0.26	0.10	.397	1.36
Institutional trust	-.02	0.15	-0.03	-0.16	-0.33	0.28	.871	1.39

Note. N = 68. CI = confidence interval; *LL* = lower limit, *UL* = upper limit. R^2 = .18. (Marginally) significant beta coefficients appear in bold.

[†] Marginally significant.

Mediation Analysis

Finally, mediation analysis was conducted. There were no significant correlations between either cognitive capacity, $\beta = .02$, $t(68) = 0.16$, $p = .872$, or risk perception about COVID-19, $\beta = .06$, $t(68) = 0.50$, $p = .619$, and the ability to distinguish between real and fake

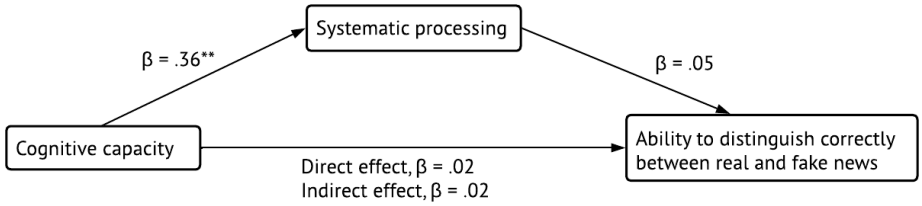
news correctly (see Figures D1 and D2). For these two variables, mediation effects are unlikely. Risk perception regarding vaccines had a significant and negative correlation with the ability to distinguish correctly between real and fake news, β = -.47, *t*(68) = -4.21, *p* = .001 (see Figure D3). Institutional trust had a significant and positive correlation with the ability to distinguish correctly between real and fake news, β = .43, *t*(68) = 3.84, *p* = .003 (see Figure D4).

Furthermore, cognitive capacity significantly and positively correlated with systematic processing, β = .36, *t*(68) = 3.09, *p* = .029. Risk perception regarding COVID-19, β = .15, *t*(68) = 1.25, *p* = .215, risk perception regarding the vaccine, β = -.12, *t*(68) = -0.95, *p* = .347, and institutional trust, β = .10, *t*(68) = 0.83, *p* = .411, did not significantly correlate with systematic processing. Moreover, systematic processing did not significantly correlate with the ability to distinguish correctly between real and fake news in the models for cognitive capacity, β = .05, *t*(68) = 0.36, *p* = .722, risk perception regarding COVID-19, β = .05, *t*(68) = 0.36, *p* = .717, risk perception regarding the vaccine, β = .00, *t*(68) = -0.01, *p* = .992, and institutional trust, β = .01, *t*(68) = 0.10, *p* = .920. No significant indirect effects of cognitive capacity, β = .02, 95% BCa CI [-.06, .12], risk perception regarding COVID-19, β = .01, 95% BCa CI [-.03, .07], risk perception regarding the vaccine, β = .00, 95% BCa CI [-.04, .04], and institutional trust, β = .00, 95% BCa CI [-.04, .04], through systematic processing were found.

Overall, the results for males showed that systematic processing did not mediate the relationships between the predictors and the outcome variable (i.e., the ability to distinguish correctly between real and fake news). Hence, hypotheses 2c, 3c and 4c were rejected.

Figure D1

Mediation Model of Cognitive Capacity as a Predictor of the Ability to Distinguish Correctly Between Real and Fake News, Through Systematic Processing, When focusing on Males

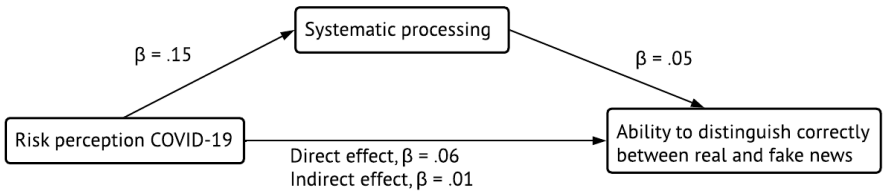


Note. $N = 68$.

**$p < .01$.

Figure D2

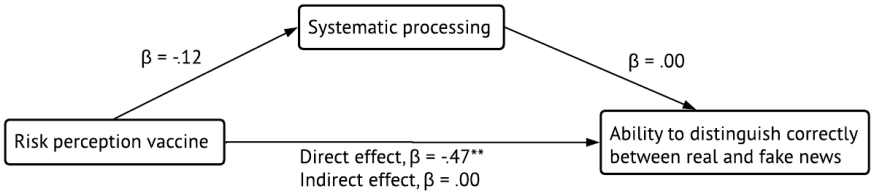
Mediation Model of Risk Perception Regarding COVID-19 as a Predictor of the Ability to Distinguish Correctly Between Real and Fake News, Through Systematic Processing, When Focusing on Males



Note. $N = 68$.

Figure D3

Mediation Model of Risk Perception Regarding the COVID-19 Vaccine as a Predictor of the Ability to Distinguish Correctly Between Real and Fake News, Through Systematic Processing, When Focusing on Males

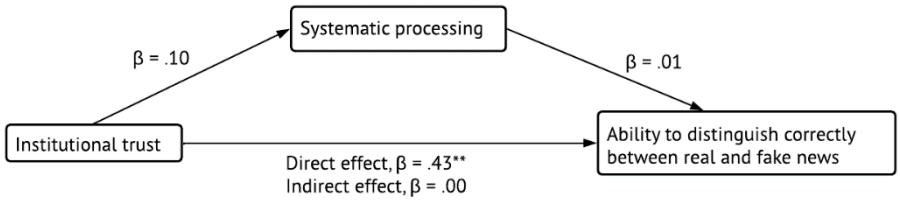


Note. $N = 68$.

**$p < .01$.

Figure D4

Mediation Model of Institutional Trust as a Predictor of the Ability to Distinguish Correctly Between Real and Fake News, Through Systematic Processing, When Focusing on Males



Note. $N = 68$.

**$p < .01$.

Analyses for Females

The data from female participants indicated a marginally significant and positive correlation between the ability to distinguish correctly between real and fake news and systematic processing, $r(165) = .12$, $p = .060$ (see Table D4). Cognitive capacity was not significantly correlated with the ability to distinguish correctly between real and fake news, $r(165) = .08$, $p = .151$. Risk perception regarding COVID-19 had a significant and positive correlation with the ability to distinguish correctly between real and fake news, $r(165) = .17$, $p = .016$. Risk perception about vaccines had a significant and negative correlation with the ability to distinguish correctly between real and fake news, $r(165) = -.47$, $p < .001$. Institutional trust was significantly and positively correlated with the ability to distinguish correctly between real and fake news, $r(165) = .35$, $p < .001$.

Overall, female participants were better able to distinguish between fake and real news if they had higher systematic processing, high risk perception about COVID-19, and high institutional trust, together with low risk perception regarding the vaccine.

Hence, limited support was found for hypothesis 1, as systematic processing was marginally significantly and positively correlated with the ability to distinguish correctly between real and fake news. Hypothesis 2a was rejected because cognitive capacity did not significantly correlate with the ability to distinguish correctly between real and fake news. Partial support was found for hypothesis 3a. The findings for vaccine risk perception were in line with hypothesis 3a, as this variable was significantly and negatively correlated with the ability to distinguish correctly between real and fake news. However, risk perception regarding COVID-19 was inconsistent with hypothesis 3a; this variable was significantly positively correlated with the ability to distinguish correctly between real and fake news. Lastly, hypothesis 4a was rejected. Institutional trust was significantly and positively correlated with the ability to distinguish correctly between real and fake news while a significant and negative correlation would have been consistent with the hypothesis.

In addition, the results showed (marginally) significant and positive correlations between systematic processing and cognitive capacity, $r(165) = .37$, $p < .001$, risk perception regarding COVID-19, $r(165) = .12$, $p = .063$, and institutional trust, $r(165) = .16$, $p = .021$. Risk perception regarding the vaccine was significantly and negatively correlated with systematic processing, $r(165) = -.13$, $p = .050$. Therefore, the higher the person's cognitive capacity, risk perception regarding COVID-19, and institutional trust, and the lower their vaccine risk perception, the greater was their systematic processing.

Hence, support was found for hypothesis 2b since cognitive capacity significantly and positively correlated with systematic processing. Partial support was found for hypothesis 3b. The findings for risk perception regarding the vaccine were in line with hypothesis 3b, as it was significantly and negatively correlated with systematic processing. However, risk perception regarding COVID-19 was not consistent with hypothesis 3b, as it was significantly correlated in a positive direction with systematic processing. Lastly, hypothesis 4b was rejected. Institutional trust was significantly and positively correlated with systematic processing, whereas a significant negative correlation would have been consistent with the hypothesis.

Table D4

Descriptive Statistics and Correlations of the Variables of Females

Variable	*M*	*SD*	1	2	3	4	5	6	7
1. The ability to distinguish correctly between real and fake news [a]	4.08	1.81	-						
2. Systematic processing [b]	3.54	0.80	.12†	-					
3. Cognitive capacity [b]	3.94	0.54	.08	.37***	-				
4. Risk perception related to COVID-19 [b]	3.35	0.76	.17*	.12†	.09	-			
5. Risk perception related to the vaccine [b]	2.97	1.10	-.47***	-.13*	-.05	-.21**	-		
6. Institutional trust [b]	2.81	0.58	.35***	.16*	.11†	.30***	-.47***	-	
7. Age	30.22	13.81	.05	.25**	.09	.17*	-.04	.20**	-

Note. $N = 167$.

[a] The variable was measured by the number of correct answers in distinguishing between real and fake news, ranging from 0 (no correct answers) to 7 (all correct answers).

[b] The variable was measured via a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

$^{\dagger}p < .10$ (one-tailed). *$p < .05$ (one-tailed). **$p < .01$ (one-tailed). ***$p < .001$ (one-tailed).

Regression Analysis

Table D5 shows that the ability to distinguish correctly between real and fake news was significantly predicted in the regression model by the following variables: systematic processing, cognitive capacity, risk perception regarding COVID-19, risk perception regarding the vaccine, and institutional trust, $F(5, 161) = 10.58$, $p < .001$, $R^2 = .25$. Risk perception regarding the vaccine contributed significantly and negatively to the prediction of the ability to distinguish correctly between real and fake news, $\beta = -.39$, $t(62) = -5.03$, $p < .001$. Institutional trust contributed marginally significantly and positively to the prediction of the ability to distinguish correctly between real and fake news, $\beta = .14$, $t(62) = 1.77$, $p = .079$. Thus, the ability to distinguish correctly between real and fake news increased when risk perception regarding the vaccine decreased and institutional trust increased. Systematic processing, cognitive capacity, and risk perception regarding COVID-19 were not significant predictors in the model.

Table D5

Linear Model of Predictors of the Ability to Distinguish Correctly Between Real and Fake News of Females

Variable	β	*SE*	*B*	*t*(161)	95% CI		*p*	VIF
					LL	*UL*		
Constant		1.32	3.19	2.41	0.57	5.80	.017	
Systematic processing	.03	0.17	0.07	0.43	-0.26	0.41	.666	1.19
Cognitive capacity	.03	0.25	0.10	0.42	-0.38	0.59	.673	1.16
Risk perception COVID-19	.04	0.17	0.08	0.49	-0.25	0.42	.624	1.11
Risk perception vaccine	**-.39**	0.13	-0.65	-5.03	-0.90	-0.39	< .001	1.30
Institutional trust	**.14**[†]	0.25	0.44	1.77	-0.05	0.93	.079	1.38

Note. $N = 167$. CI = confidence interval; *LL* = lower limit, *UL* = upper limit. $R^2 = .25$. (Marginally) significant beta coefficients appear in bold.

[†] Marginally significant.

Table D6 shows that systematic processing was significantly predicted in the regression model by cognitive capacity, risk perception regarding COVID-19, risk perception regarding the vaccine, and institutional trust, $F(4, 162) = 7.48$, $p < .001$, $R^2 = .16$. Cognitive capacity contributed significantly and positively to the prediction of systematic processing, $\beta = .35$, $t(162) = 4.85$, $p < .001$. Thus, systematic processing increased when cognitive capacity increased. Risk perception regarding both COVID-19 and the vaccine as well as institutional trust were not significant predictors in the model.

Table D6

Linear Model of Predictors of Systematic Processing of Females

Variable	β	*SE*	*B*	*t*(162)	95% CI		*p*	VIF
					LL	*UL*		
Constant		0.61	1.18	1.95	-0.02	2.38	.053	
Cognitive capacity	**.35**	0.11	0.52	4.85	0.31	0.73	< .001	1.02
Risk perception COVID-19	.05	0.08	0.06	0.69	-0.10	0.21	.492	1.11
Risk perception vaccine	-.07	0.06	-0.05	-0.80	-0.17	0.07	.428	1.30
Institutional trust	.07	0.12	0.10	0.86	-0.13	0.33	.390	1.38

Note. N = 167. CI = confidence interval; *LL* = lower limit, *UL* = upper limit. R^2 = .16. Significant beta coefficients appear in bold.

Mediation Analysis

Mediation analysis found no significant correlation between cognitive capacity and the ability to distinguish correctly between real and fake news, β = .04, $t(167) = 0.50$, $p = .617$ (see Figure D5). For this variable, a mediation effect was unlikely but was examined nonetheless for completeness. Risk perception regarding the vaccine had a significant and negative correlation with the ability to distinguish correctly between real and fake news, β = -.47, $t(167) = -6.72$, $p < .001$ (see Figure D6). Risk perception regarding COVID-19, β = .15, $t(167) = 1.99$, $p = .049$, and institutional trust, β = .34, $t(167) = 4.56$, $p < .001$, had significant and positive correlation with the ability to distinguish correctly between real and fake news (see Figures D7 and D8).

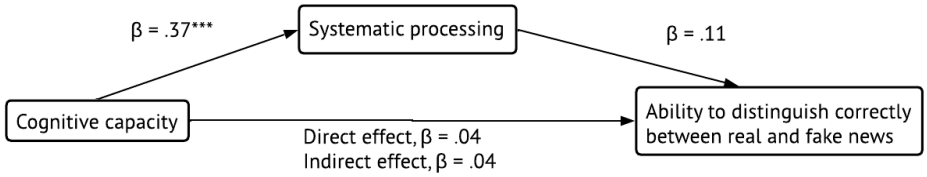
Furthermore, cognitive capacity, β = .37, $t(167) = 5.09$, $p < .001$, and institutional trust, β = .16, $t(167) = 2.05$, $p = .042$, significantly and positively correlated with systematic processing. Risk perception regarding the vaccine marginally significantly and negatively correlated with systematic processing, β = -.13, $t(167) = -1.66$, $p = .099$. Risk perception regarding COVID-19 did not significantly correlate with systematic processing, β = .12, $t(167) = 1.53$, $p = .127$. Moreover, systematic processing did not significantly correlate with the ability to distinguish correctly between real and fake news in the models of cognitive capacity, β = .11, $t(167) = 1.26$, $p = .209$, risk perception regarding COVID-19, β = .10, $t(167) = 1.33$, $p = .187$, risk perception regarding the vaccine, β = .06, $t(167) = 0.88$, $p = .379$, and institutional trust, β = .07, $t(167) = 0.91$, $p = .364$. No significant indirect effects operating through systematic processing were found for cognitive capacity, β = .04, 95% BCa CI [-.02, .11], risk perception regarding COVID-19, β = .01, 95% BCa CI [-.01, .04], risk perception

regarding the vaccine, β = -.01, 95% BCa CI [-.03, .01], and institutional trust, β = .01, 95% BCa CI [-.01, .04].

Overall, the results for females showed that systematic processing did not significantly mediate the relationships between the predictors and the ability to distinguish correctly between real and fake news. Thus, hypotheses 2c, 3c, and 4c were rejected.

Figure D5

Mediation Model of Cognitive Capacity as a Predictor of the Ability to Distinguish Correctly Between Real and Fake News, Through Systematic Processing, When Focusing on Females

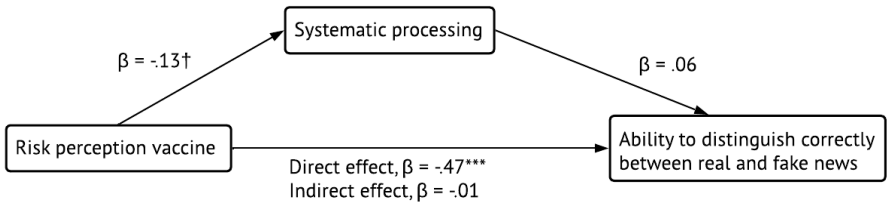


Note. $N = 167$.

***$p < .001$.

Figure D6

Mediation Model of Risk Perception Regarding the COVID-19 Vaccine as a Predictor of the Ability to Distinguish Correctly Between Real and Fake News, Through Systematic Processing, When Focusing on Females

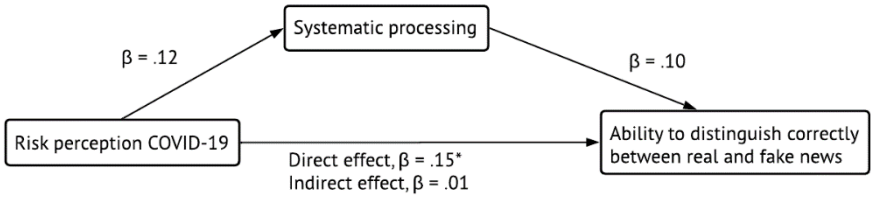


Note. $N = 167$.

***$p < .001$. $^{\dagger}p < .10$.

Figure D7

Mediation Model of Risk Perception Regarding COVID-19 as a Predictor of the Ability to Distinguish Correctly Between Real and Fake News, Through Systematic Processing, When Focusing on Females

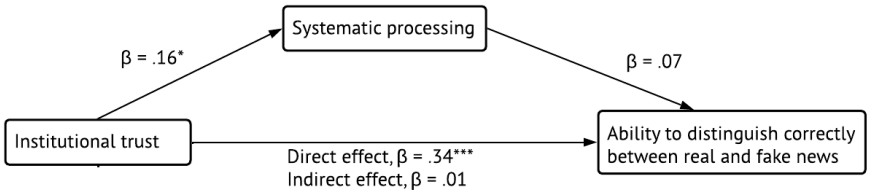


Note. $N = 167$.

*$p < .05$.

Figure D8

Mediation Model of Institutional Trust as a Predictor of the Ability to Distinguish Correctly Between Real and Fake News, Through Systematic Processing, When Focusing on Females



Note. $N = 167$.

*$p < .05$. ***$p < .001$.