



Refusing the COVID-19 Vaccines: Justifications, FLICC Strategies and (Dis)Trust

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Abstract

From a scientific perspective, it has been shown that vaccinations are the best way to prevent serious illness and potential death from COVID-19, and to reduce transmission of the virus (CDC, 2022). Still, several people choose not to be vaccinated against COVID-19. We investigated through sixteen interviews how people justify their choice not to be vaccinated and if their justifications are substantiated by FLICC strategies (Diethelm et al., 2009) These are: fake experts, logical fallacies, impossible expectations, cherry-picking and conspiracy theories. In addition, we looked at who these people trust for information about COVID-19 vaccines since they do not follow official advice. The interviews revealed that there are three overarching ways to justify their choice. That is, denying the necessity, the safety, and the effectiveness of the COVID-19 vaccines. Various FLICC strategies were extensively used to substantiate this view, where logical fallacies, impossible expectations and cherry-picking are the most prominent. Further, most participants appeared not to trust the official authorities, such as the government, the RIVM, or the WHO, due to inconsistencies in policy and communication, and because participants believe these authorities have other motives, such as money and power. Participants trust acquaintances or alternative media and some do not trust anyone except their own judgement. Participants determine who can be trusted through: confirmation, intuition, and judging character. This study has provided extensive insight into how unvaccinated people justify their choice and who they trust for information about COVID-19 vaccinations.

Keywords: COVID-19 vaccination, science denialism, FLICC strategies, (dis)trust

Refusing the COVID-19 Vaccines: Justifications, FLICC Strategies and (Dis)Trust

Science denial has existed for centuries (McIntyre, 2018), but has become prominent again during the corona crisis (Rutjens et al., 2021). Although for many people the confidence in science has increased during the pandemic, there is also a group that questions scientific knowledge (van den Broek-Honingh et al., 2021). The most recent example is distrust of the safety, usefulness, and effectiveness of COVID-19 vaccines. This skepticism in scientific knowledge can lead to the decision not to get vaccinated. Yet from a scientific perspective, it has been shown that vaccinations are the best way to prevent serious illness and potential death due to COVID-19 (CDC, 2022). In addition, vaccination also reduces the transmission of the virus (de Gier et al., 2021). So, according to scientific evidence, the choice not to vaccinate against COVID-19 can be harmful to the person himself, but also to others. Given the rapidly mutating virus, it appears that even more vaccinations will be needed in the future. Therefore, from the perspective of protecting people's health and containing the pandemic, this type of science denial is problematic.

Nevertheless, a significant group of people think it is the best decision to not get a COVID-19 vaccine for multiple reasons. In the Netherlands, 13.6 percent of the population aged eighteen and over has not taken any vaccinations against COVID-19 (RIVM, 2022). Various studies suggest that fear of side effects, lack of trust in institutions, and general safety seem to be the most important reasons (Uslu et al., 2021; Razai et al., 2021). These reasons are not conforming to the scientific consensus regarding the use, necessity, and safety of COVID-19 vaccinations, and the advice from the RIVM (Dutch national institute for health en environment) and the World Health Organization (WHO, 2021). According to these institutions, vaccination against COVID-19 is necessary, effective, and safe (RIVM, 2022). Current research supports this position. In light of this evidence about the effectiveness, and safety of the vaccines, the question is how unvaccinated people justify their choice not to be vaccinated. For example, how do some

unvaccinated people justify their fear of severe side effects, while science shows that side effects are generally mild? The main question that is intended to be answered in this study is: *How do unvaccinated people justify their choice not to take a COVID-19 vaccine?*

In addition, the research focuses on trust. Since a significant group does not follow the advice of the RIVM and the WHO and the rules/guidelines of the government that follow from it, it seems that these organizations are not trusted. But if the official institutions are not trusted, who do people trust, and why? The second research question responds to this and reads: *Who do unvaccinated people trust for information about vaccination, and why?*

Five characteristics of science denialism: FLICC

Previous research into science denialism has identified a number of strategies science denialists often use in their reasoning: people may rely on *fake experts*, they fall prey to *logical fallacies*, they have *impossible expectations*, they rely on *cherry-picking* evidence, and they may believe in *conspiracy theories*, summarized by the acronym FLICC (Diethelm et al., 2009). These strategies can be seen as rhetorical arguments, to give the appearance of legitimacy, but serve the ultimate purpose of rejecting a proposition on which scientific consensus exists. Although the strategies serve a purpose, they are not necessarily used on purpose. That is, they may be seen as legitimate arguments by the user. This is possible because errors underlying the reasoning are not always obvious and reasoning errors can be caused by cognitive limitations, which individuals might not realize. Based on the fact that the FLICC strategies are used to deny scientific facts in other domains such as anthropogenic climate change (Cook et al., 2018), it is expected that they will also apply to the current context to deny the scientific consensus on COVID-19 vaccines. The FLICC strategies, and how they may be used to deny scientific consensus surrounding COVID-19 vaccines, will be explained in more detail.

Fake experts

The first strategy is the use of *fake experts*. People are more likely to believe claims if they are offered by experts (Pornpitakpan, 2004), but they often lack the resources, knowledge, or time to determine if someone is a real expert in a relevant field. Reference can therefore be made to real experts but in a different, unrelated field. A degree in one field does not make you an expert in another field. But such a fake expert can appear convincing, especially if there are more fake experts together. Another form of fake experts is the *fake debate*. This often happened during the pandemic on talk shows, where experts and non-experts appeared on the same show to talk about vaccination. This can create the illusion that a scientific debate exists about, for example, the usefulness of vaccination, while among most experts there is no debate about this.

Logical fallacies

The second strategy consists of *logical fallacies*. These are logically incorrect reasons, which result in invalid conclusions. Logical fallacies exist in various forms. For example, the *straw men* argument, where someone misrepresents or exaggerates the argument, thereby not addressing the real argument (Madson, 2007). For example, people claim that COVID-19 vaccines were developed too fast, therefore they cannot have a good safety profile. This is a straw man fallacy because it paints a misleading picture of the development, which was so fast not because corners were cut, but because so many resources were thrown at the problem. Another logical fallacy is a *statistical fallacy*. A common statistical fallacy is the *base rate fallacy*, where people neglect the base rate while making a probabilistic judgment and only use specific information (Welsh et al., 2012). A frequently heard argument against the effectiveness of vaccines was the fifty-fifty split of vaccinated and unvaccinated people in the ICU at the time. However, the fact that the group vaccinated people (the base rate) is much larger than the group of unvaccinated people is not taken into account (Egger & Egger, 2022).

Impossible expectations

The third strategy is having *impossible expectations* of what science can achieve. This strategy exploits the probabilistic nature of science and can be applied in several ways. First, research often does not result in one answer but provides the best estimate within a range of estimated values. This means science does not provide perfect proof. Second, within medical science, there are no treatments one hundred percent effective, and there are no treatments one hundred percent safe. People often demand one hundred percent safety before taking a vaccine, but science can never provide this. This does not mean that it is not safe in general. Also, the vaccines are not one hundred percent effective. Vaccinated people can still get very ill and even die. But this does not mean that vaccination does not work in general. Science is not about providing certainty; science is about probability. Another form of these impossible expectations is called *moving goalposts*. Here, science deniers are demanding higher, or other, evidence after receiving the requested evidence (Clark et al., 2005). In this way, one can never provide enough evidence to prove their right.

Cherry-picking

The fourth strategy is *cherry-picking* evidence. This is done by looking for scientific evidence that confirms someone's opinion while ignoring the evidence to the contrary, even if this is more. Usually, research is cited that endorses a position that goes against the consensus. Due to the probabilistic nature of science, not all research will find an effect if there is one, and some research will show an effect, even if there is no real effect. So it is likely that a study exists that confirms one's position, whatever that may be. This is also the case with research on COVID-19 vaccines. Individuals can cite these findings to confirm their anti-vaccination opinion while ignoring the pro-vaccination consensus. Cherry-picking evidence can be done intentionally, to make it look like someone is providing evidence. But it can also be done unintentionally, caused by a cognitive bias named *confirmation bias* (Hart et al.,

2009). This is a tendency to search, interpret, favor and recall information that confirms one's prior beliefs. This bias is well-documented, and most people are sensitive to this fallacy (Stanovich et al., 2013).

Conspiracy theories

The fifth and last strategy is the identification of *conspiracy theories*. These are defined by explaining impactful events, like 9/11, the murder of John F. Kennedy, and also the COVID-19 pandemic, as the malevolent acts of secret and powerful groups (Douglas et al., 2019). Research suggests that people are drawn to conspiracy theories when certain psychological needs are not begin met. These needs are *avoiding uncertainty*, *feeling in control*, and *social needs* (Douglas, 2020). For example, the lack of control during a pandemic can be removed by stating that it is all controlled by powerful groups. This can give people the feeling that they can influence it, as opposed to it being all caused by a random virus people cannot control. Conspiracy theories have diverged widely during the pandemic, from believing Bill Gates put chips in the vaccines, to thinking the virus is a bioweapon designed in a Chinese laboratory (Douglas, 2021). The most prominent conspiracy in the Netherlands is called 'the Great Reset' conspiracy, named after the book by Klaus Schwab, which states that the pandemic is used by the elites to dismantle capitalism and enforce radical social change (Alba, 2020). A problem with conspiracy theories is that they are hard to disprove. In case clues are found that disprove the theory, it can always be said that this is part of the conspiracy. Therefore, a semblance of truth remains.

This research aims to provide a better understanding of the reasons people have and understanding ways in which they justify their choice not to get vaccinated using the FLICC strategies. In addition to being used to negate scientific consensus, the FLICC strategies also suggest a degree of distrust in official authorities. In particular, the *fake expert* and *conspiracy theory* strategies, in which authorities and experts are distrusted, while fake experts are trusted

and conspiracy theories are believed. These beliefs appear to be predicted by the information source (Ali et al., 2020). It is therefore relevant to also pay attention to the question of whom and which source unvaccinated people trust for information about vaccination and why.

Trust

Trust can be defined as a ‘standing decision’ for believing someone (Rahn & Transue, 1998). Trust can help alleviate uncertainty, making information processing more efficient (Lee et al., 2005). This reduces the complexity of the situation, as is the case during a pandemic (Priest et al., 2003). For example, it is less complex to rely on a person (expert) for the choice of vaccination than to weigh all the pros and cons yourself. Previous research has shown that trust in government is of great importance in times of crisis (Rodriguez et al., 2018). This also appears to be the case for adherence to the recommended measures for the COVID-19 crisis (Han et al., 2021) and getting vaccinated (Purvis et al., 2021; Lockyer et al., 2021). But what makes a person or message reliable?

A sizeable body of research indicates that people often use the credibility of the messenger as a heuristic, or information shortcut, for whether to accept certain information (Eagly & Chaiken, 1993; Petty & Cacioppo, 1986). Other examples of these information shortcuts are the confidence heuristic and the degree of consistency of the information. The confidence heuristic is the tendency to interpret the confidence or certainty with which information is expressed as a signal of accuracy or knowledge (MacFarlane et al., 2020). This is often related to the consistency of the information, which is one of the most important elements of trust (Dunn, 2000). However, based on the epistemology of science, this can cause some problems. Science is inherently uncertain (less confidence) and can therefore be inconsistent. Misinformation can provide certainty (more confidence) because they are not bound by scientific integrity and ethics. This is indeed shown by Carrasco-Farré (2022), who also found that misinformation requires less cognitive effort and is more responsive to emotions.

Combined with the findings of Lee et al. (2005), to alleviate the uncertainty of a pandemic, it may be more attractive to trust misinformation. This can therefore lead to misbeliefs about vaccination or even the belief in conspiracies.

Once people have taken a position, they look for information to confirm their view. As with the cherry-picking strategy, confirmation bias plays a major role here (Hart et al., 2009). This tendency works both ways; people start looking for conforming information, but people also have more trust in information that confirms their beliefs (Stanovich et al., 2013). A logical consequence of this is that individuals are more likely to trust persons who profess views with which they agree, which might be fake experts.

All in all, trust in a person or source can come about in different ways. However, it is still unclear which factors or heuristics are most relevant in the current context, and what role the FLICC strategies play in this. Nor do we know whom unvaccinated people trust for information about COVID-19 vaccination. It is therefore relevant to delve deeper into this, to find out who is trusted, and why.

Relevance

While the current study focuses on understanding rather than reducing people's science denialism, this knowledge can help develop interventions to deal with vaccine skepticism and increase vaccination rates in the future. A better understanding of the reasons and strategies people use may help to prevent them from being misled (or misleading themselves) and can be used to effectively neutralize misinformation (Cook et al., 2018), also in other domains of science (Schmid & Betsch, 2019). In addition, a better understanding of the mechanisms around (dis)trust can help increase trust in authorities, which is important during a crisis (Rodriguez et al., 2018).

From a theoretical point of view, it is good to investigate whether the FLICC strategies are also useful in the current context. Cook et al. (2008) showed that the model is complete within the

context of climate change denial, but it is not known whether it is also complete and useful for science denial in the middle of a crisis. It also creates a better understanding of which strategy or strategies are most important in this context, and how they are used.

The current study

In summary, the main goal of this research is to find out how unvaccinated people justify their choice not to be vaccinated against COVID-19 and what role the FLICC strategies play in this. We examined what kind of justifications people rely on for not taking a COVID-19 vaccine and examined whether the FLICC techniques are used to support their justifications. We further aimed to understand the role that trust plays, e.g., whether the people who are not vaccinated trust the ‘official’ sources (WHO, government, CDC) or not and whether they base their views on different sources or persons. The question is whether individuals are more likely to trust a source if it aligns with their prior ideas (confirmation bias), or whether they perhaps use other heuristics (e.g. confidence heuristic).

To answer the research questions, a qualitative design was chosen, in which one-in-one semi-structured online interviews were conducted. This was chosen because the research focuses on reasons why participants have not been vaccinated, whereby their reasoning strategies are examined. In addition, participants were able to explain in this way which persons or sources they trust, and how they determine who or what can be trusted. The interviews were conducted in Germany and the Netherlands between January 27, 2022 and March 10, 2022, when there was still a lockdown. At that time, you also had to be tested without a vaccination certificate to enter public places.

Method

Participants and design

Sixteen participants voluntarily participated in the study ($M_{\text{age}} = 37.25$, $SD_{\text{age}} = 14.24$). Of these participants, nine were male and seven were female. Eight participants were Dutch

people who live in the Netherlands, and eight participants were German people living in Germany. The sample consisted of a heterogeneous group in terms of age and occupation. For a complete overview of the demographics of all the participants, see appendix A. A condition for participation was that the participant voluntarily is not vaccinated against COVID-19. We recruited the using a convenience sample. The participants were asked verbally whether they wanted to participate in the study by a friend. If they were interested, they could contact the researchers. This way, an attempt was made not to put any pressure on participation. All participants were unknown to the researchers, so there was no conflict of interest.

Interview questions focused on participants' thoughts about the usefulness, necessity, and safety of COVID-19 vaccinations and the main reason why they are not vaccinated against COVID-19. For example, "What do you think about the usefulness of vaccinations?" "What do you think about the need for vaccination?" "What do you think about the safety of vaccinations?" In addition, questions were asked about how they obtained information about their choice and how they determine who or what source they can trust for information about vaccination. For example, "Who do you trust for information about COVID vaccination?" "How do you determine which source of information about vaccination you can trust?" For the complete questionnaire¹, see Appendix B.

Procedure

After participants contacted the researchers, all relevant information was sent to them. See appendix C for the document with all the information for the participants. An appointment was then made for the online interview. Before the interview, the participant had the opportunity to ask questions. Subsequently, the informed consent was read by the researcher. The participant had to agree to participate. See Appendix D for the informed consent. After that, the interview began. The interviews were conducted by two different

¹ The interviews also contained questions related to another study, which were not relevant to the current study.

interviewers, one in German and one in Dutch. The interviews lasted approximately one hour, of which the questions for this research were asked in the first half-hour.

During the interviews, there was room to ask questions about certain topics if something was not clear. If a participant did not understand the question, we asked the same question in a different form. This way, we tried to get a useful answer to every question. If a participant was unable to answer a question, for example, because it was too long ago, or because he or she did not have an answer to it, the question was skipped. This was the case, for example, when a question was asked about the effectiveness of the COVID-19 vaccines, but the participant has never consulted the relevant figures and therefore did not know. Finally, participants were allowed to say whatever they wanted without the interviewers giving them information or arguing with them.

Positioning

To determine whether a justification was 'wrong', we compared the justifications with the scientific consensus that existed at the time on the topic in question. We used sources that represent the current scientific consensus, such as the WHO, RIVM, CDC, and scientific papers. Appendix E contains an overview of the current state of the science regarding the various themes. Our position is therefore in line with the WHO, RIVM, and the CDC, and means that vaccination against COVID-19 is necessary, useful, and safe for anyone over the age of eighteen. During the interviews, however, we avoided that this position was known by the participants.

Analysis

For the analysis, we conducted a thematic analysis (Braun et al., 2012). During the interviews, we made audio recordings. As the first step of the analysis, we transcribed the audio recordings. Subsequently, we translated all the interviews into English. This was necessary because half of the interviews were in Dutch and the other half were in German.

We stored the translated transcripts on a safe drive from the University of Groningen for analysis. No hiccups, pauses, or intonations were included in the transcript, prioritizing content and readability. All transcripts were pseudonymized by removing identifiable information (e.g., names, locations). Numbers were used to indicate different speakers. We then thoroughly read the transcripts and summarized them.

FLICC

The next step involved coding the transcripts. We started our analysis with the justification part. To do this, we read through the transcripts and highlighted relevant quotes. We did this based on the question: What justifications do participants give for not getting a COVID-19 vaccine? This was a reiterative, inductive process, from which various codes were devised: *risk perception*, *general threat*, *alternative solutions*, *long-term safety concerns*, *concern about side effects*, and *the ineffectiveness of the vaccines against severe illness, death, and transmission*. Eventually, we created new documents per code with all the relevant quotes.

We then divided the codes into three overarching themes. These are about the *necessity for vaccinations*, the *safety of vaccinations*, and the *effectiveness of vaccinations*. The theme of necessity includes the codes *risk perception*, *general threat* and *alternative solutions*. The theme of safety includes the codes *long-term safety concerns*, and concerns about *side effects*. The theme of effectiveness includes the codes *ineffectiveness of the vaccines against severe illness/death* and the *ineffectiveness of the vaccines against transmission*. We have created new documents for the three themes with all relevant quotes in them.

In these documents, we searched in a deductive manner for the use of FLICC strategies to deny the necessity, safety, and effectiveness of COVID-19 vaccines. The analysis aimed to find out whether and which FLICC strategies were used for the various justifications participants gave for not being vaccinated against COVID-19. In the end, we ended up with

three documents containing all the quotes from participants, divided by theme, which also indicated which FLICC strategy had been used. It was possible to extract from these documents how often which theme was named by the participants, as well as which FLICC strategies were used for which theme. See Appendix F for an overview of these frequencies.

(Dis)Trust

The same thematic analysis (Braun et al., 2012) was performed for the analysis on (dis)trust. We based the coding process on two questions: Who do the unvaccinated trust for information about vaccination? How do participants determine whom to trust? This was again a reiterative and inductive process. For the first question, we arrived at the codes that participants trust *acquaintances*, *authorities*, *alternative media* and *nobody but themselves*. These all fell under the theme *who*. Answering the second question about how participants determine whom to trust, we came to the codes that they trust information that *confirms* their view, that it can be an *intuition*, and that participants can *judge the character* of the person. These codes were subsequently called *confirmation*, *intuition*, and *judging character*, and fell on the theme of *why*. In addition to the question of whom participants trust for information about COVID-19, we also paid attention to the question of whom they do not trust and why, and how they relate to various FLICC strategies. Here, we came to the themes of *inconsistencies*, *conspiracy theories* and *conflicting views* to explain their distrust in authorities. Again, we created new documents per code with all the relevant quotes.

Results

How do unvaccinated people justify their choice not to take the COVID-19 vaccine?

This section describes how the different themes were used to justify the choice to not get vaccinated against COVID-19 and the role of FLICC strategies in substantiating their justifications. Note that the justifications given by participants for their choice are evaluated in relation to the current scientific consensus, as described in Appendix E.

Justifications

Necessity for vaccinations. The first way participants justify their choice not to be vaccinated is by stating that the COVID-19 vaccines are not necessary. We found that this is substantiated in three different ways: *risk perception*, *general threat*, and *alternatives*, which we will explain in more detail.

Risk perception. First of all, most (14) participants indicate that the COVID-19 is only dangerous for the weak and the elderly, but that it is harmless for young people. They all considered themselves healthy enough and so they don't need the vaccine, as P9 describes here: "So for me, the virus does not seem to be dangerous [...] the risk is super low." These participants thought that vaccination could be useful for the vulnerable.

General threat. A few (2) participants stated that COVID-19 as a whole is not dangerous, at least no more dangerous than the flu. Therefore, the situation isn't that bad, argues P5: "I'm just denying the seriousness of the situation." This makes them think that they do not need the vaccine, but that it is not necessary for the weak or the elderly either.

Alternatives. Finally, some (6) participants pointed to alternative ways of fighting the pandemic, which in their view makes vaccination unnecessary. Four participants pointed to the low number of beds for intensivists in hospitals, as P10 does: "So the COVID-19 pandemic would probably have been much more harmless if the health system in Germany had been on a better level." Two participants pointed to hydroxychloroquine and ivermectin as effective agents to treat COVID-19.

Safety of vaccinations. The second way participants justify their choice is by stating that the COVID-19 vaccines are not safe. We found that two different safety concerns are pointed out here by participants: *Long term effects* and *side effects*, which we will explain in more detail.

Long-term effect. First, many (10) participants point to the unknown long-term effects of the vaccines, as P1 shows: “Because research is based on short-term effects [...] So then yes, I feel I just don't feel safe enough with it. I don't think it's safe enough already to vaccinate.” They believe that insufficient research has been done on this, or that the development was too fast, and therefore do not consider the vaccines safe.

Side effects. Most (11) participants point to harmful side effects of the vaccines. They are already seeing these side effects around them, from which they conclude that the vaccines are not safe. The mentioned side effects varied widely, for example, “complaints with her uterus” (P1), “that MRNA that you get inside you, it never goes away” (P5), and “there also have been deaths from the vaccines” (P8).

Effectiveness of vaccinations. The third way participants justify their choice is by stating that the vaccinations are not effective. Here, we made a distinction between denying the effectiveness to prevent serious *illness and death* and denying the effectiveness to reduce the *transmission* of the virus.

Illness and death. Half (8) of the participants claimed that the vaccines are not effective in preventing serious illness or death, including P9: “And when I see how the numbers constantly go up and down again, for me this is not related to the vaccination. So, for me, the vaccination has nothing positive.” (Which is inconsistent with the finding that many participants thought it was useful for the vulnerable, see previous point).

Transmission. Most (13) participants denied the effectiveness of the vaccines to reduce transmission, such as P12: “No matter how many times you're vaccinated, you can play a part in contributing.” Two participants did not take a clear position or did not mention anything about it during the interviews.

Substantiation and FLICC strategies

Necessity for vaccinations. Within the theme of denying the necessity for vaccination, we identified several FLICC strategies, including *cherry-picking* and *logical fallacies*. Per justification, we will explain how the strategies are used.

Risk perception. Every participant substantiate the point that vaccinations are not necessary by referring to the vulnerable who get sick, while young and healthy people who have become seriously ill, contracted long COVID or even died are ignored. For example P2 does not see any risk: “Why should I, as a healthy young person, where the virus has no effect at all, take such a drug?” However, ignoring relevant information, like young and healthy people that got seriously ill, and focusing only on the vulnerable and elderly, is a form of *cherry-picking*. Cook (2020) calls this form of cherry-picking a *slothful induction*, where relevant information is ignored when coming to a conclusion.

General threat. Claiming that vaccination is not necessary for anyone, because the threat is not serious, is on the one hand an extreme form of *cherry-picking*, where all data about hospital admissions and deaths are ignored. On the other hand, this is also a *logical fallacy*. For example, P8 compares COVID-19 to the flu: “If you look at it now, the number of deaths corresponds to a severe flu season. Those are the numbers. Should you be so afraid of that?” Although this is not in line with the WHO figures (see Appendix E), this comparison also does not take into account all measures taken during the pandemic. When comparing COVID-19 to the flu, you should consider what would have happened if we reacted to COVID-19 the same as we normally do to the flu. Philosophers call this *counterfactual reasoning* (Boudry, 2021). Research shows that a lot of suffering has been prevented by measures and vaccinations (see appendix E).

Alternatives. Lastly, pointing to alternative medicine for the treatment of COVID-19 is also done by *cherry-picking* evidence. For example, P8 is referring to doctors and articles that

promote alternative medicine: “That comes from other articles or from doctors. If it turns out that that works, such as hydroxychloroquine and ivermectin. There are a lot of stories of doctors saying it works.” However, it is shown that hydroxychloroquine and ivermectin are not effective against COVID-19 (see appendix E), still pointing to doctors who praise these ineffective medicine is a form of *cherry-picking*, because the doctors who have come up with evidence that it doesn't work are ignored.

Safety of vaccinations. Within the theme of denying the safety of the COVID-19 vaccines, we identified several FLICC strategies, including *cherry-picking*, *logical fallacies*, and *impossible expectations*. Per justification, we will explain how the strategies are used.

Long-term effects. To question the safety of vaccinations in the long term, *impossible expectations* are mainly used. Half of the participants pointed to the uncertainty that exists about the long-term consequences. This would be because you will only know what the vaccines do in a few years, so you can't say anything about it yet, such as P13: “[About the safety] how do you know that if you have developed it [the vaccines] this quickly? I mean, some things just turn out later, when you just wait ten years or so.” However, it is an *impossible expectation* to expect science can guarantee one hundred percent long-term safety, and therefore it is unrealistic to demand this. There are already many stringent tests to ensure the vaccines' safety. In addition, waiting five to ten years to know more about the long-term effect will lead to more sick people, people with long COVID, and deaths from COVID-19.

Also, participants made *logical fallacies* to doubt the safety. This mainly focuses on the development of vaccinations. Although not incomprehensible to think, it is logically incorrect to conclude that vaccines are not (or cannot be) safe just because they have been developed and produced so quickly. For the COVID-19 vaccinations was much more money and resources available for the development than for vaccines where the need is less acute. In addition, coronaviruses are not new, so a lot of research has already been done.

Side effects. Many participants were concerned about short-term safety. They substantiated this with a combination of *cherry-picking*, having *impossible expectations*, and possibly a *logical fallacy*. Personal *anecdotes* are often seen as evidence, a technique that falls under *cherry-picking*. For example P9: "That I now have many people in my private circle who strangely have extremely elevated blood pressure since the third vaccination." While there may be individuals who will be adversely affected by the vaccination, this does not prove that the vaccine is not safe. It is also (possibly) a *logical fallacy* to interpret this correlation as causation, although it cannot be ruled out. In addition, thinking that no one should suffer from side effects is having *impossible expectations*.

Effectiveness of vaccinations. Within the theme of denying the effectiveness of the COVID-19 vaccines, we identified several FLICC strategies, where again *cherry-picking*, *impossible expectations*, and *logical fallacies* are the most used once. Per justification, we will explain how the strategies are used.

Illness and death. As with the denial of the safety of the vaccinations, to deny the effectiveness much emphasis is placed on individual cases where the vaccine was ineffective, as P10 shows: "And I also have some in my environment, they are vaccinated against it and are seriously ill" Pointing to individual cases rather than looking at all the data is *cherry-picking* and expecting the vaccine to be one hundred percent effective against serious illness or death is having *impossible expectations*.

Other participants made *logical fallacies* to deny the effectiveness of the vaccines. For example, P8, who looked at the hospital rates to conclude that vaccines are not effective: "If you go get boosters, you will get less sick or you will not come to the hospital. While I think, if you look at how high the infections are now and how empty the hospitals are now, it has just more or less become a milder cold/flu." However, the high infection rates in combination with low hospitality are not only caused by the less pathogenic virus variant Omicron but also

due to the high vaccination rates.

Finally, a few participants say there is no evidence for the effectiveness of vaccinations because the studies that have been done are not good. For example, P5: “If you think that those figures from your study show a result [effectiveness of vaccination], then there should be no other explanation possible.” However, in a scientific study, all possible alternative explanations cannot realistically be ruled out. But that does not mean that the results mean nothing. Therefore, to demand that there should be no other explanations is having *impossible expectations*.

Transmission. To deny the effectiveness against transmission, participants only pointed at individual cases where a vaccinated person still got infected, as P16 shows: “In my environment, there are a lot of vaccinated people and eighty percent of these people have already had COVID.” Again, pointing to individual cases rather than looking at all the data is *cherry-picking*, and expecting the vaccine to be one hundred percent effective against transmission is having *impossible expectations*.

Who do the unvaccinated trust for information about vaccination, and why?

Although the question that this section attempts to answer focuses on whom the participants do trust, we will first briefly explain whom they do not trust as many participants started by listing people or organizations that they do not trust, based on the question of whom they do trust. Next, an answer will be given to the question of whom they do trust. Finally, we will try to answer the question of why they seem to trust these persons or sources. In each subsection, the use of FLICC strategies will be analyzed.

Distrust

Most (13) participants indicated that they did not trust the government. Many (9) also indicated that they did not trust RIVM/RKI (Robert Koch Institute, German official health institute), and two participants expressed their distrust in the pharmaceutical sector. Only

three participants indicated that they trust the government and the RIVM/RKI. It is not surprising that these authorities are not trusted, after all, the advice they give is not followed. There are three main reasons why these agencies are not trusted. Because of *inconsistencies* in policy or reporting, because of belief in *conspiracy theories*, or because someone has *conflicting views*.

Inconsistencies. Of the thirteen participants who indicated that they did not trust the government and/or the RIVM/RKI, in most (10) cases this appeared to be (partly) due to the observed inconsistencies. These inconsistencies may be in government policy, for example, as P4 observed: “Yes, sometimes they [the Dutch government] just contradict themselves. From a week earlier. You say this one week and the next it's that.”, but also in the RIVM/RKI numbers, like P13 is saying: [about the effect of vaccination] They just say this today, that tomorrow.”

Conspiracy theories. Some (7) participants did not trust the official authorities for reasons that we interpreted as conspiracy theories. This was mainly referred to after the question was asked about why participants thought that the government advises everyone to get vaccinated, given that participants did not think it was safe, necessary, or effective. To explain this, participants speculated that the government has different intentions to vaccinate people than for public health. These intentions varied widely between the participants.

The most common explanation for this was that the government has motives other than public health, such as money and power. Some (6) participants gave this as an explanation for the vaccination campaign, as illustrated by P15: “So money, money is behind it and that might also be quite interesting to know how many politicians have shares in BioNTech. So that has now become an incredibly profitable business.”

There was a similar distrust of the pharmaceutical industry among some of the participants. For example, by stating that they have financial motives and for that reason strongly influence the government.

P12: I personally think that the politics have also been very strongly influenced by the pharmaceutical industry, which of course has a great interest in vaccinating as much and widely as possible and gladly also three, four, five, six times, and I wonder very much whether that would be necessary for this mass, with this risk.

Some participants went even further in their suspicions. In five interviews, the conspiracy theory 'The Great Reset' was mentioned. Despite using the same name for this, the interpretation of this conspiracy was different for everyone. For example, according to one participant, the plan was to move to a QR society in which everyone could be monitored by the government. But another participant referred to an agenda of a group of 'globalists'.

P3: [After the question about why the government wants everybody to get vaccinated] Yes, because of course they have that agenda of 2030. They want to work towards that. [...] The World Economic Forum is a very large organization, and they have a plan. [...] There's just a very large group of globalists, they've been at it for years, and that group is getting bigger and bigger. [...] They have only one goal, they just want to go out into the world with a certain large group of people. Power and greed. And that's what the agenda is for. [...] I firmly believe in that, that we just have a lot of people on this globe and that that must be cleared."

Conflicting views. Authorities and individuals were distrusted by some participants (5) because they have different views on COVID-19 vaccinations than participants. Anyone who doesn't share the same opinion is mistrusted, as is clear from this example from P5: "Who now says that the COVID-19 vaccine is good and safe, I do not trust him anyway." This

mainly occurred to explain who is not trusted, as P13 shows: “But I don't believe any of the politicians. Even Lauterbach. I mean, he is a doctor, but I do not believe him either. So this is just my opinion now.” Because an opinion can only contradict your opinion if you have already taken a position, it seems that conflicting views are not the reason that authorities or individuals are mistrusted, but a consequence of these conflicting views.

FLICC

Distrusting government is not the same as denying science. However, politicians rely on scientific studies. Distrusting their information is thus related to science denial. In addition to the government, some participants also distrusted the RIVM/RKI because of inconsistent messaging. While we do not deny that there are inconsistencies in policies or reporting from various authorities, it is an *impossible expectation* to expect that science knows everything right. This is expressed by P5, who distrusts the WHO due to an inconsistency: “The WHO says there's a virus coming with an IFR of 3.4. [...] But in July they say like ‘sorry it's not 3.4 but 0.23’ and now it turns out to be 0.15.” Science does not stand still and can therefore the numbers can change over time.

Subsequently, participants explain the actions of these agencies by stating that they have different intentions, interpreted in this study as *conspiracy theories*. It satisfies the definition of Douglas et al. (1990), who state that major events are explained by powerful groups. This is also one of the FLICC strategies. Suspecting *nefarious intent* is mainly used because the intentions of these authorities are doubted. Especially financial interests and power are mentioned to explain the intention of the vaccination campaign. However, this strategy is applied in a different way than is often done in science denial, namely by stating that scientists are not honest and therefore the data is wrong. In the current context, the conspiracies are not so much about science and scientist, but more about the people who make policy.

Whom do they trust?

When asked whom participants do trust for information about COVID-19 vaccination, various answers were given. We distributed these answer under the following themes: acquaintances, authorities, alternative media, and nobody but themselves. we will explain these themes in more detail.

Acquaintances. Half (8) of the participants mainly trusted acquaintances from their personal circles, such as friends or family. For example, P10 mainly trusts friends: “Um, in my close environment I have a few, uh, friends whom I trust a lot.

Authorities. A smaller group (4) of participants did trust authorities such as the government, the RIVM, or the RKI, in which a distinction was sometimes made in trust between the government and other authorities, such as RIVM/RKI, WHO, or CDC. In none of the cases trust was unconditional, but most did not have the impression that those authorities had bad intentions. For example P7: “That I do not expect that there are people in any government organization who want to do us harm. So that applies to the government, the RIVM, any government organization.” It is remarkable that these participants believed the figures from the RIVM or RKI, but not the interpretation and the conclusions of these figures. This is well illustrated by P10:

P10: Um, so the Robert Koch Institute, I read the weekly report practically every week, I already trusted it. So, I didn't believe that they were faking any numbers or anything. [...] In the evaluation of the figures, I didn't trust the Robert Koch Institute so much. Like, I look at the numbers, I interpreted the numbers myself, and ignored the interpretation of the RKI.

Alternative media. Other (4) participants specifically referred to alternative media. On the one hand, these are well-known (Dutch) alternative channels, as P8 calls it: “You're going to look for information. Maurice de Hond, Artsencollectief (doctors collective), BlackBox TV

I watch. Yes, I think that is honest, reliable sources of information.” On the other hand, it concerns individual 'experts' who do not appear in the Mainstream media. P9 shows this here, after being asked whom he trusts for information: “There are various professors and scientists who do not appear in these mainstream media, of course, which is of course due to the fact that they do not correspond to the opinion.”

Nobody but themselves. A few (4) participants indicated that they did not trust anyone, did not know whom to trust, or only trusted themselves. There was, however, a difference in how this was expressed. For example, P5 was quite firm about this: “Well... Whom do I trust? I trust myself. The information from the hospitals or from doctors who say that... actually I don't trust anyone but myself. I better say that.” While P1 wasn't quite sure: [About whom to trust] “Yes, I don't really know that. No idea. Everyone gives his or her opinion, but we don't know what it really is.” In addition, many participants seem to believe their observations or experiences. This is not specifically referred to by the participants but is apparent from the belief in various *anecdotes* as proof.

FLICC

Trusting other people and channels instead of the 'official' ones is a form of relying on *fake experts*. It is obvious to people from a personal circle that they are not experts, nor do they pretend to be. Yet sometimes they are believed, while experts are not believed. The same goes for trusting yourself if you are not an expert.

Another obvious form of *fake experts* is the trust of alternative media and doctors this does not appear in the mainstream media. The term fake experts does not mean that these people are not experts at all, but that they are either experts in an irrelevant field or that they are one of the few to take a position that goes against the consensus. For example, one participant refers to Maurice de Hond, a social geographer, and thus not a relevant expert to trust for information about COVID-19 vaccination.

Reference is also made to alternative media, such as BlackBox TV and Artsencollectief. This is a form of *bulk fake experts*, where multiple ostensible experts come together to proclaim a different message. These channels can appear trustworthy because they seem professional. However, many of their positions contradict the current scientific consensus, as described in Appendix E.

Why do they trust them?

The question of how participants determine who or what they can trust turned out to be a difficult question for several participants. For example, half of the participants indicated that the question about how they determine whom to trust is very difficult. This was done, for example, by P2: “No, I can't really explain that at all.”, P6: “That's a very good question. Whom can you trust in that? I think it's complicated.” And P14: “Mmm. Oh, that's a difficult question. I was, that's very, very hard.” Ultimately, the participants came up with three main reasons for deciding whom to trust: *confirmation*, *intuition*, and *judging character*.

Confirmation. It seemed like some (6) participants were looking for confirmation. This was done on purpose (conscious) by a few participants as well as not on purpose (unconscious) by other participants. Also, there is a lot of overlap between confirmation and the other two reasons. In conscious confirmation, participants looked for persons or sources that confirmed their point of view on purpose and were thus aware of their bias. This is demonstrated by several participants, such as P5: “So someone who has been vaccinated is looking for confirmation. And so do I.”, and P12: “Yes, I believe him and I don't believe that, and maybe that's just because he represents my opinion and he does not.” In addition, participants also indicated that it is easier to talk to someone who shares his or her opinion, such as P6: [About talking with people that share their view] “Yes, more often of course. That's easier. Just like it's easy to talk about those who have been vaccinated if you are too. You get group formation.”

However, it seems that participants also unconsciously looked for confirmation. For example, P1 indicates to trust Diederik Gommers (Dutch Intensive Care physician who appeared in the mainstream media many times during the pandemic) because he 'admits' that not everyone needs a vaccination: "I think he is a bit more realistic. He also admits honestly that not everyone needs to be vaccinated. I think he says it a bit more honestly." It seems that Gommers is trusted because his statement is in line with her view.

Intuition. Half (8) of the participants indicated that they trust people based on intuition or gut feeling. They could not quite pinpoint why this was happening, as illustrated by P3: "I think that's part of intuition. And of course a combination with your feeling about this whole story." This has also been described as instinctive, such as by P8, after asking how she decides who to trust: "That's instinctive." In addition, there were also people who simply 'felt' that the whole situation was not right, for no apparent reason, such as P5: "From the very first moment I said, 'this is not right'." If you already know what you think about something beforehand, confirmation bias is lurking.

Judging character. Finally, same (7) participants indicated that they judge the character. How individuals are judged varies widely. However, it seems that heuristics are used for this decision. For example, one participant mainly looks at whether someone lives with God. P4: "Yes, in terms of trust, I mainly look at the person themselves and how honest they are. In life and whether they live with God, I think that is just so important." Some look at how authentic someone comes across, like P14: "That's just an authentic guy and you know that he really expresses his opinion, stands for what he says and doesn't represent any foreign interests now." Others look at whether someone has relevant expertise, and with how much certainty this is provided, like P7: "Depending on their expertise. A football coach talking about vaccination, that would be a real concern to me. And how high someone is in my

esteem. Whether I have the idea that someone who says something can also think for himself.“

FLICC

The most common strategy used to determine whom to trust is *cherry-picking*. It seems that this is strongly caused by *confirmation bias*. Participants indicate that they trust people who agree with them, that it is easier to talk to like-minded people and sometimes they even consciously look for confirmation. Here, therefore, only confirming information is sought, while contradictory information is ignored, which is cherry-picking.

This tendency to seek confirmation is also related to reliance on *fake experts*. For example, the participants suggest that they trust these fake experts precisely because they have the same opinion. Judging character can also lead to trusting fake experts. For example, a doctor can appear authentic, but at the same time lack relevant expertise. Also, looking at whether a person lives with God is not a reliable way to determine whether you can trust that person for information about COVID-19 vaccination. In fact, religiosity is a predictor of anti-vax beliefs (Rutjens et al., 2021).

Discussion

To protect yourself and others, vaccination against COVID-19 is the best solution according to current scientific findings (CDC, 2022). Scientific research also shows that vaccination is safe and effective (WHO, 2021). Still, some people refuse to be vaccinated against COVID-19. This study focused on better understanding the justifications people give for that choice. It was examined whether FLICC strategies were used to substantiate their position (Diethelm et al., 2009). The main research question was: How do unvaccinated people justify their choice not to take a COVID-19 vaccine?

The findings show that several arguments are made to justify the choice not to take a vaccine against COVID-19. The main justifications provided by participants are that

vaccinations are not necessary because COVID-19 is not serious, vaccinations are not safe in the long term or they cause serious side effects, or are ineffective to prevent serious illness, death, or transmission of the virus. These findings are the same reasons other research has found (Uslu et al., 2021; Razai et al., 2021). Within these themes, a distinction is made between several arguments. The necessity for vaccines is denied because participants feel healthy enough, they say is not necessary for anyone because COVID-19 is not serious, or because there are alternative ways to fight the pandemic. The safety of the vaccines is denied by pointing to the uncertainty of the long-term effects, or by stating that there are severe side effects. The vaccine's effectiveness is denied by stating that it does not work to prevent serious illness, death, or transmission

In addition to other studies, this study showed how participants substantiated that vaccinations are not necessary, safe, or effective, given that this is not true according to the current scientific consensus. They made frequent use of various FLICC strategies. In particular, participants made several logical fallacies, for example by not reasoning counterfactually, they had impossible expectations about how effective the vaccines should be, and they often cherry-picked information that confirms their view to deny the scientific consensus. Often, these strategies were combined, especially impossible expectations and cherry-picking, when pointing to individuals who had severe side effects or still got seriously ill after vaccination. This shows that people often base their views on their observations, and not on data or research.

This also explains why participants did not use fake experts or conspiracy theories to substantiate their justifications. Not citing fake experts suggests that participants do not consult sources or experts to arrive at their point of view. Instead, they rely primarily on their observation, as has frequently been done by relying on anecdotes, a form of cherry-picking. Using conspiracy theories was mainly about the purpose of the vaccination campaign, and

was not used, for example, to explain certain research results in favor of vaccination. This is in line with not citing a fake expert because rarely did a participant cite studies as a source.

In addition to focusing on the justifications people give, the role of (dis)trust in people and information about COVID-19 vaccinations was also examined, since people who do not vaccinate do not follow government/WHO/RIVM/RKI advice. The question that has been answered is: Who do the unvaccinated trust for information about vaccination, and why?

As could be expected, most participants did not trust official government or WHO/RIVM/RKI reporting. This seems to be mainly due to the inconsistencies in policy and communication, the impossible expectations that many participants have about what science can achieve, and the fact that their information is contrary to their own views. The latter suggest that confirmation bias plays a role here. Conspiracy theories have been used by several participants to varying degrees to explain why these authorities want everyone to be vaccinated, even though it is not necessary, safe, or effective according to these participants. Other intentions behind the vaccination campaign were mainly sought in financial interests and power.

Those who are trusted for information about the vaccines are acquaintances, alternative media or nobody but themselves. Interestingly, also some people trust the official authorities. But this was mostly just about the numbers. The interpretation of these numbers, on the other hand, was not trusted. Information often seems to be trusted when it supports one's view, probably caused by confirmation bias. This suggests that people are looking for confirmation and therefore cherry-pick information. Another way people determine whom they can trust is through intuition. In that case, people can't describe why someone is reliable, it just feels that way. The confirmation bias may also play a role here. The last way is by judging the character of the person. This examines how reliable someone appears or how much expertise he or she has. Together, this research showed that individuals make use of different heuristics to

determine who to trust.

Implications

The results provide a comprehensive picture of the justifications and arguments that people give for not being vaccinated against COVID-19. While most studies focus on predictors of vaccine refusal, the current research provides a picture of what people who do not want to get vaccinated are thinking and why. We showed that their arguments can get categorized within the FLICC concept and that the concept is a useful and complete tool in the current context. Also, we've shown how people use different strategies, for example by citing anecdotal evidence repeatedly or setting impossible expectations. With this, we have shown how the strategies are applied and which ones are used the most. This also provides an insight into the underlying cognitive mechanisms for information processing, and to which cognitive biases people fall prey. The fact that the model has also proved useful and complete in this context suggests that, as Cook et al. (2008) also argue, FLICC can be used in any context where science is denied.

From a practical point of view, a better understanding of science denial is necessary to develop effective interventions to reduce vaccine refusal, and also to reduce science denial in other domains. Research shows that correcting misinformation is effective if you show people why it is false (Vraga et al., 2020). Therefore, it is necessary to understand what the person in question is thinking, and why. This applies not only to the COVID-19 context but also to other areas where scientific facts are denied (Schmid & Betsch, 2019).

In addition, we have shown that people do not always take in information objectively and rationally. These results can be used for communicating scientific information or for explaining policy choices in the future, taking into account the fallibility of human reasoning. In doing so, attention may be given to promoting critical and bias-free thinking, as well as public understanding of science.

Next, this research also made clear how mistrust and trust are created. This supplements the current literature on (dis)trust, in particular on the role of (dis)trust in times of crisis.

Previous research has already shown the importance of trust in times of crisis, to which we have added how this trust in authorities can decrease and who is then trusted for information. From a practical point of view, this is useful for policymakers, scientists, and other public figures who need trust from individuals in their work. For example, it has been shown that inconsistencies can lead to mistrust, which is important knowledge for policymakers.

Limitations and suggestions for future research

The current research has some limitations. For example, it is not possible to conclude from current research whether the stated justifications of the participants were the reasons for not taking vaccination or only justifications afterward. Responses from some participants suggested that the arguments are justifications because they knew from the first moment that "it wasn't right". While answers from other participants suggest that they based their position on their arguments. In the first case, the question remains open how they arrived at a certain position in the first place, after which they justify it with arguments. final choice.

Further, it cannot be said with certainty that the sources that participants use are not reliable, and thus fit within the fake expert strategy, or that they are reliable but were cherry-picked. This is because some participants referred to scientific studies, without specifying which studies these were. It was decided not to ask which studies were referred to, because this may come across as suspicious. The main purpose of the study was to examine how participants substantiated their position. In the study, it was therefore decided to follow the 'official authorities', although this information might also be fallible.

Another possible limitation concerns the fact that only Dutch and German participants were studied. It is possible that in other countries different reasons are given or strategies are used. After all, part of the research was about where subjects got their information from, and

why they did or did not trust the authorities. In other countries, however, information is conveyed differently, and the government also acts differently. For example, this study found that public policy inconsistency was often cited, but this may not be the case in other countries. Follow-up research can therefore focus on other countries to find out any differences.

Another suggestion for further research is to investigate the causal relationship between (dis)trust and the use of FLICC strategies. This research suggests that the relationship works both ways. If you do not trust the information from the authorities, you will need FLICC strategies to substantiate your position. Conversely, if you come to different conclusions through FLICC strategies than authorities, this can lead to distrusting their information. However, this study does not provide evidence for the causal relation between (dis)trust and FLICC strategies.

Conclusion

Overall, this study has shown how different people view vaccinations against COVID-19, thereby justifying their choice to refuse a COVID-19 vaccine. It has been shown that the FLICC model is a useful tool to describe the argumentation of these justifications, which leads to a better understanding of what participants think, and why. In addition, this study has partly mapped out the role of (dis)trust, which has shown to be an essential aspect during a health crisis. This study contributes to a better understanding of the psychology of people who do not conform to the scientific consensus during a pandemic. This has both scientific and social relevance that can be used during the current pandemic, any subsequent pandemics, or other areas where the scientific consensus is denied and experts as mistrusted.

References

- Alba, D. (2020, Nov 17). The Baseless 'Great Reset' Conspiracy Theory Rises Again. *New York Times*. <https://www.nytimes.com/live/2020/11/17/world/covid-19-coronavirus#the-baseless-great-reset-conspiracy-theory-rises-again>.
- Ali, S., Foreman, J., Tozan, Y., Capasso, A., Jones, A. & DiClemente, R. (2020). Trends and predictors of COVID-19 information sources and their relationship with knowledge and beliefs related to the pandemic. *Nationwide Cross-Sectional Study JMIR Public Health Surveillance*, 6(4). DOI: 10.2196/21071
- Braun, V. & Clarke, V. (2012) Thematic analysis. In H. Cooper, P. M. Camic, D. L. Long, A. T. Panter, D. Rindskopf, & K. J. Sher (Eds), *APA handbook of research methods in psychology*, 2, 57-71. American Psychological Association.
- Boudry, M. (2021, March 7). De Preventieparadox. Maarten Boudry. <https://maartenboudry.be/2021/03/de-preventieparadox.html>
- Carrasco-Farré, C. (2022) The fingerprints of Misinformation: how Deceptive Content Differs from Reliable Sources in terms of Cognitive Effort and Appeal to Emotions. *Humanities and Social Sciences Communication*, 9(162). <https://doi.org/10.1057/s41599-022-01174-9>
- Center of Disease control and Prevention. (2022, June 19). *COVID-19 vaccination*. <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/your-vaccination.html>
- Clark, J., Clark, T. (2005). Moving the goalposts, Humbug! *The Skeptic's Field Guide to Spotting Fallacies in Thinking*, 101.
- Cook, J, Ellerton, P, Kinkead, D. (2018). Deconstructing climate misinformation to identify reasoning errors. *Environmental Research Letters*, 13.
- De Gier, B., Andeweg, S., Joosten, R., ter Schegget, R., Smorenburg, N., van de Kasstelee, J., Hahne, s., van den Hof, S., de Melker, H., Knol, M. (2021). Vaccine effectiveness

- against SARS-CoV-2 transmission and infections among household and other close contacts of confirmed cases, the Netherlands, February to May 2021. *Euro Surveillance*, 26(31). <https://doi.org/10.2807/1560-7917>.
- Diethelm, P., & McKee, M. (2009). Denialism: What Is It and How Should Scientist Respond? *European Journal of Public Health*, 19(1).
- Ditto, P. H., Pizarro, D. A., & Tannenbaum, D. (2009). Motivated moral reasoning. *Moral judgment and decision making*. 307–338. Elsevier Academic Press. [https://doi.org/10.1016/S0079-7421\(08\)00410-6](https://doi.org/10.1016/S0079-7421(08)00410-6)
- Douglas, K. M. (2021). COVID-19 conspiracy theories. *Group Processes & Intergroup Relations*, 24(2), 270–275. <https://doi.org/10.1177/1368430220982068>
- Douglas, K. M., Uscinski, J. E., Sutton, R. M., Cichocka, A., Nefes, T., Ang, C. S., Deravi, F. (2019). Understanding conspiracy theories. *Political Psychology*, 40, 3–35. <https://doi.org/10.1111/pops.12568>
- Dunn, P. (2000) The Importance of Consistency in Establishing Cognitive-based Trust: A Laboratory Experiment. *Teaching Business Ethics* 4, 285–306. <https://doi.org/10.1023/A:1009870417073>
- Eagly, A. H., & Chaiken, S. (1993). The psychology of attitudes. *Harcourt Brace Jovanovich*.
- Egger, S., Egger, G. (2022). The vaccinated proportion of people with COVID-19 needs context. *The lancet*, 399, 627.
- Fiolet, T., Guihur, A., Rebeaud, M. E., Mulot, M., Peiffer-Smadja, N., & Mahamat-Saleh, Y. (2021). Effect of hydroxychloroquine with or without azithromycin on the mortality of coronavirus disease 2019 (COVID-19) patients: a systematic review and meta-analysis. *Clinical microbiology and infection: the official publication of the European Society of Clinical Microbiology and Infectious Diseases*, 27(1), 19–27. <https://doi.org/10.1016/j.cmi.2020.08.022>

- Finucane, M. L., Alhakami, A., Slovic, P., & Johnson, S. M. (2000). The affect heuristic in judgments of risks and benefits. *Journal of Behavioral Decision Making*, 13(1), 1–17.
doi: 10.1002/(SICI)1099-0771(200001/03)13
- Han, Q., Zheng, B., Cristea, M., Agostini, M., Bélanger, J., Gützkow, B., & Leander, N. (2021). Trust in government regarding COVID-19 and its associations with preventive health behaviour and prosocial behaviour during the pandemic: a cross-sectional and longitudinal study. *Psychological Medicine*, 1-11.
- Hart, W., Albaracin, D., Eagly, A., Brechan, I., Lindberg, M., Merrill, L. (2009). Feeling Validated Versus Being Correct: A Meta-Analysis of Selective Exposure to Information. *Psychological Bulletin*, 135(4), 555-88
- Imhoff, R., Zimmer, F., Klein, O., Antonio, J., Babinska, M., Bangerter, A., Bilewicz, M., Blanusa, N., Bován, K., Buzarovska, R., Cichocka, A., Belouee, S., Douglas, K., Dyrendal, A., Etienne, T., Gjoneska, B., Graf, S., Gualda, E., Hirschberger, G., Kende A. *et al.* (2021). Conspiracy mentality and political orientation across 26 countries. *Nature Human Behaviour*. <https://doi.org/10.1038/s41562-021-01258-7>
- Kahneman, D. (2013). *Thinking, fast and slow*. Farrar, Straus & Giroux Inc.
- Lee, C., Scheufele, D. A., & Lewenstein, B. V. (2005). Public attitudes toward emerging technologies: Examining the interactive effects of cognitions and affect on public attitudes toward nanotechnology. *Science Communication*, 27, 240-267.
- Lockyer, B., Islam, S., Rahman, A., Dickerson, J., Pickett, K., Sheldon, T., Sheard, L. (2021). Understanding COVID-19 misinformation and vaccine hesitancy in context: Findings from a qualitative study involving citizens in Bradford, UK. *Health Expect*, 24(4), 1158-1167.
- MacFarlane, D., Hurlstone, M. J., & Ecker, U. K. (2020). Protecting consumers from fraudulent health claims: A taxonomy of psychological drivers, interventions, barriers,

and treatments. *Social Science & Medicine*, 259.

<https://doi.org/10.1016/j.socscimed.2020.112790>

Madsen, P. (2007). How to Win Every Argument: The Use and Abuse of Logic. *Continuum International Publishing Group*, 155–157.

McIntyre, L. (2018). *Post-Truth*. The MIT Press.

Meslé, M., Brown, J., Mook, P., Hagan, J., Pastore, R., Bundle, N., Spiteri, G., Ravasi, G., Nicolay, N., Andrews, N., Dykhanovska, T., Mossong, J., Sadkowska-Todys, M., Nikiforova, R., Riccardo, F., Meijerink, H., Mazagatos, C., Kyncl, J., McMenamin, J., Melillo, T., Kaoustou, S., Lévy-Bruhl, D., Haarhuis, F., Rich, R., Kall, M., Nitzan, D., Smallwood, C., Pebody, R. (2021). Estimated number of deaths directly averted in people 60 years and older as a result of COVID-19 vaccination in the WHO European Region, December 2020 to November 2021. *Euro Surveillance*, 26(47).

<https://doi.org/10.2807/1560-7917.ES.2021.26.47.2101021>

Motta, M., Stecula, D., Farhart, C. (2020) How Right-Leaning Media Coverage of COVID-19 Facilitated the Spread of Misinformation in the Early Stages of the Pandemic in the U.S. *Canadian Journal of Political Science*, 53, 335–342.

OECD. (2017). *Trust and public policy: How better governance can help rebuild public trust*. OECD Publishing.

Petty, R. E., & Cacioppo, J. T. (1986). Communication and persuasion: Central and peripheral routes to attitude change. Springer-Verlag.

Pornpitakpan, C. (2004). The persuasiveness of source credibility: A critical review of five decades' evidence. *Journal of Applied Social Psychology*, 34, 243-281.

Priest, S. H., Bonfadelli, H., & Rusanen, M. (2003). The “trust gap” hypothesis: Predicting support for biotechnology across national cultures as a function of trust in actors. *Risk Analysis*, 23, 751-766.

- Purvis, R.S., Hallgren, E., Moore, R.A., Willis, D.E., Hall, S., Gurel-Headley, M., McElfish, P.A. (2021). Trusted Sources of COVID-19 Vaccine Information among Hesitant Adopters in the United States. *Vaccines*, 9. <https://doi.org/10.3390/vaccines9121418>
- Rahn, W. M., & Transue, J. E. (1998). Social trust and value change: The decline of social capital in American youth. *Political Psychology*, 19, 545-565.
- Razai, M., Oakeshott, P., Esmail, A., Wiysonge, C., Viswanath, K., & Mills, M. (2021). COVID-19 vaccine hesitancy: the five C's to tackle behavioural and sociodemographic factors. *Journal of the Royal Society of Medicine*, 114(6), 295–298.
- Reis G, Silva EASM, Silva DCM, Thabane L, Milagres AC, Ferreira TS, Dos Santos CVQ, Campos VHS, Nogueira AMR, de Almeida APFG, Callegari ED, Neto ADF, Savassi LCM, Simplicio MIC, Ribeiro LB, Oliveira R, Harari O, Forrest JI, Ruton H, Sprague S, McKay P, Guo CM, Rowland-Yeo K, Guyatt GH, Boulware DR, Rayner CR, Mills. (2022) Effect of Early Treatment with Ivermectin among Patients with Covid-19. *New England Journal of Medicine*, 386(18), 1721-1731. doi:10.1056/NEJMoa2115869.
- Rodriguez, H., Donner, W., & Trainor, J. (2018). Handbook of disaster research. *Springer International Publishing*.
- Rutjens, B. T., van der Linden, S., & van der Lee, R. (2021). Science skepticism in times of COVID-19. *Group Processes & Intergroup Relations*, 24(2), 276-283.
- Rutjens, B. T., Sengupta, N., der Lee, R. van, van Koningsbruggen, G. M., Martens, J. P., Rabelo, A., & Sutton, R. M. (2022). Science Skepticism Across 24 Countries. *Social Psychological and Personality Science*, 13(1), 102-117.
<https://doi.org/10.1177/19485506211001329>
- Schmid, P., Betsch, C. (2019). Effective strategies for rebutting science denialism in public discussions. *Nature Human Behavior*, 3. 931–939. <https://doi.org/10.1038/s41562-019-0632-4>

- Stanovich, K.E., West, R.F., Toplak, M.E. (2013), Myside bias, rational thinking, and intelligence. *Current Directions in Psychological Science*, 22(4), 259–264. doi:10.1177/0963721413480174, S2CID 14505370
- Stemler, S. (2000). An overview of content analysis. *Practical Assessment, Research, and Evaluation*, 7(17). DOI: <https://doi.org/10.7275/z6fm-2e34>
- Su, M. H., Liu, J., McLeod, D. M. (2019). Pathways to news sharing: Issue frame perceptions and the likelihood of sharing. *Computers in Human Behavior*, 91, 201-210. <https://doi.org/10.1016/j.chb.2018.09.026>
- Uslu, A., Lazar, D., Perlis, R., Baum, M., Quintana, A., & Ognyanova, K. (2021). *The COVID States Project #63: The decision to not get vaccinated, from the perspective of the unvaccinated*.
- Vraga, E. K., Kim, S. C., Cook, J., & Bode, L. (2020). Testing the Effectiveness of Correction Placement and Type on Instagram. *The International Journal of Press/Politics*, 25(4), 632–652. <https://doi.org/10.1177/1940161220919082>
- Van Bavel, J. J., Baicker, K., Boggio, P. S., Capraro, V., Cichocka, A., Cikara, M., Crockett, M. J., Crum, A. J., Douglas, K. M., Druckman, J. N., Drury, J., Dube, O., Ellemers, N., Finkel, E. J., Fowler, J. H., Gelfand, M., Han, S., Haslam, S. A., Jetten, J., Willer, R. (2020). Using social and behavioural science to support COVID-19 pandemic response. *Nature Human Behaviour*, 4, 460–471. <https://doi.org/10.1038/s41562-020-0884-z>
- Van den Broek-Honingh, N., Glas, I., & Vennekens, A. (2021). *Vertrouwen van Nederlanders in wetenschap (enquête 2021)*. Rathenau Instituut.
- Van Prooijen, J.-W., Douglas, K. M., de Inocencio, C. (2018). Connecting the dots: Pattern perception predicts belief in conspiracies and the supernatural. *European Journal of Social Psychology*, 48, 320–335. <https://doi.org/10.1002/ejsp.2331>
- Welsh, Matthew B., Navarro, Daniel, J. (2012). Seeing is believing: Priors, trust, and base

- rate neglect. *Organizational Behavior and Human Decision Processes*, 119(1). 1–14. doi:10.1016/j.obhdp.2012.04.001.
- William, H., Albarracin, D., Eagly, A.H., Brechan, I. Lindberg, M.J. Merrill, L. (2009). Feeling validated versus being correct: A meta-analysis of selective exposure to information. *Psychological Bulletin*, 135(4), 555–88. doi:10.1037/a0015701,
- World Health Organization. (2021, November 15). *COVID-19 advice for the public: Getting vaccinated*. WHO. <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/covid-19-vaccines/advice>

Appendix A

Participant	Gender	Age	Nationality	Occupation
P1	Female	24	Dutch	Student Social Work
P2	Male	24	Dutch	Marine
P3	Female	38	Dutch	-
P4	Male	33	Dutch	Residential counselor for disabled care
P5	Male	56	Dutch	Company that makes respirators
P6	Male	32	Dutch	Commercial Director
P7	Male	30	Dutch	Swimming teacher
P8	Female	44	Dutch	Clinical team manager in drug research
P9	Female	21	German	Photographer
P10	Male	21	German	Chemistry student
P11	Female	60	German	Postwoman
P12	Male	39	German	Data manager and research assistant
P13	Female	65	German	Retiree, before farmer, has university degree
P14	Male	27	German	Student
P15	Male	30	German	Test engineer
P16	Female	52	German	Therapist

Appendix B

Views on COVID-19 vaccine

- What is your opinion on the COVID-19 vaccines? (usefulness, necessity, safety)
- What are the reasons for not being vaccinated?
- What are your plans for vaccinating against COVID-19 in the future?
- What do you think vaccines do to the COVID situation? (hospitality, death rates)
- Do you think it is wise for others to get vaccinated? Why?
- Government says you also vaccinated for other, what do you think about that?
- Why do you think the government wants people to be vaccinated?

Getting information

- How did you get your information for this decision? What do you read in the media? People close to you? What are these people saying?
- When did you first start reading about it? What was the source? How did you go about finding more information?
- What role did your social environment play in your decision not to get vaccinated?
- Who do you trust for information about COVID vaccination? At the expense of the government and the RIVM? [if not, why not?]
- How do you determine which source of information about vaccination you can trust?
- How do you determine which person you can trust for information about vaccination?
- How do you know you are making the right choice?
- Is it specific to the COVID-19 vaccine? Or also for other vaccines? [only for the COVID vaccine, why?]

Appendix C



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INFORMATION ABOUT THE RESEARCH

VERSION FOR PARTICIPANTS

“VIEWS ON COVID-19 VACCINATION”

PSY-2122-S-0144

Why do I receive this information?

- You are being invited to participate in this research study from the University of Groningen because you have indicated you have not been vaccinated against COVID-19.
- This research involves 2 master students, Rowan Haen and Anne Magnusson from the University of Groningen in the Netherlands and it is supervised by Prof. Dr. K. Stroebe and Prof. dr. Ernestine Gordijn.
- The start date of the research will be 22-08-2021 and the end date of the research will be 15-06-2022.

Do I have to participate in this research?

Participation in the research is voluntary. However, your consent is needed. Therefore, please read this information carefully. Ask all the questions you might have, for example because you do not understand something. Only afterwards you decide if you want to participate. If you decide not to participate, you do not need to explain why, and there will be no negative consequences for you. You have this right at all times, including after you have consented to participate in the research.

Why this research?

The purpose of this study is to gain a better understanding of reasons why people prefer not to be vaccinated against COVID-19. In doing so, the study also aims to gain insights into the role the social environment plays in deciding not to be vaccinated, as well as the types of information people seek (and trust).

What do we ask of you during the research?

First you will be asked to consent to participate in this research. If you agree to participate in the research, you will be interviewed about your view and opinion on COVID-19 vaccination during approximately 60 minutes. In particular, we will ask you about your opinion of the vaccine itself, and how you came to your decision and which information you trust. Moreover, we would like to know how you perceive your social environment to evaluate the vaccine, how your decision to not get vaccinated influenced your relationships with others around you, and what groups with different ideas about the vaccine you can identify within society. The interviews will be recorded on audio, so that it can be listened back for analysis later.

What are the consequences of participation?

By participating in the study, there is a time investment of one hour. In addition, we are aware that talking about this topic may arouse strong feelings and emotions. We believe there are little to no risks associated with participating in this study. However, it is possible that you may find some questions difficult to answer or would prefer not to answer them. Please remember that you may always withdraw from the study, which does not have any negative consequences for you.

How will we treat your data?

- Your data will be used to write a Master thesis, and possibly to write an empirical article in a scientific peer reviewed journal.
- Your data is confidential. While no personal data is collected, your personal responses to the questions asked in the interviews are the main data that is processed and analyzed during the research. We collect this data for scientific purposes. Only the researchers of this study will have access to the data.
- All relevant data provided in the interviews will be processed by the students and the principal investigators. After the interviews, the transcripts of the interviews are pseudonymized. That is, your personal data and further identifiers will be removed from the transcripts. Due to possible matching of transcripts and audio recording, a full anonymization cannot be assured. The audio recordings will be stored, under protection of a password, at a safe University of Groningen server for a period of 10 years. Until then, you have the right to access, modify, and erase your data.

What else do you need to know?

You may always ask questions about the research: now, during the research, and after the end of the research. You can do so by emailing the researchers involved: views.on.covid.vaccination@gmail.com

Do you have questions/concerns about your rights as a research participant or about the conduct of the research? You may also contact the Ethics Committee of the Faculty of Behavioural and Social Sciences of the University of Groningen: ec-bss@rug.nl.

Do you have questions or concerns regarding the handling of your personal data? You may also contact the University of Groningen Data Protection Officer: privacy@rug.nl.

As a research participant, you have the right to a copy of this research information.

Appendix D



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INFORMED CONSENT

“VIEWS ON COVID-19 VACCINATION”
PSY-2122-S-0144

- I have read the information about the research. I have had enough opportunity to ask questions about it.
- I understand what the research is about, what is being asked of me, which consequences participation can have, how my data will be handled, and what my rights as a participant are.
- I understand that participation in the research is voluntary. I myself choose to participate. I can stop participating at any moment. If I stop, I do not need to explain why. Stopping will have no negative consequences for me.
- Below I indicate what I am consenting to.

Consent to participate in the research:

☐ Yes, I consent to participate

☐ No, I do not consent to participate

Consent to make audio recordings during the research:

☐ Yes, I consent to make audio recordings of me as a participant in the research.

☐ No, I do not consent to make audio recordings of me.

Consent to processing my personal data:

☐ Yes, I consent to the processing of my personal data as mentioned in the research information. I know that until seven days after the interview I can ask to have my data withdrawn and erased. I can also ask for this if I decide to stop participating in the research.

☐ No, I do not consent to the processing of my personal data.

You have the right to a copy of this consent form.

Appendix E

Scientific fact	Source
Vaccines are safe	https://www.who.int/news-room/questions-and-answers/item/coronavirus-disease-(covid-19)-vaccines-safety
Vaccines are effective against severe illness and death	https://www.who.int/news-room/feature-stories/detail/vaccine-efficacy-effectiveness-and-protection
Vaccines are effective to reduce transmission	https://www.who.int/news-room/feature-stories/detail/vaccine-efficacy-effectiveness-and-protection
Ivermectin is not effective against COVID-19	Reis et al., (2022). Effect of Early Treatment with Ivermectin among Patients with Covid-19. <i>New England Journal of Medicine</i> , 386(18). 1721-1731. doi:10.1056/NEJMoa2115869.
Hydroxychloroquine is not effective against COVID-19	Fiolet, T et al., (2021). Effect of hydroxychloroquine with or without azithromycin on the mortality of coronavirus disease 2019 (COVID-19) patients: a systematic review and meta-analysis. <i>Clinical microbiology and infection: the official publication of the European Society of Clinical Microbiology and Infectious Diseases</i> , 27(1), 19–27. https://doi.org/10.1016/j.cmi.2020.08.022
Anyone can get sick with COVID-19 and become seriously ill or die at any age	https://www.who.int/westernpacific/emergencies/covid-19/information/asymptomatic-covid-19
COVID-19 is more deadly than Influenza	https://github.com/mbevand/covid19-age-stratified-ifr#readme
COVID-19 vaccines did prevent a lot of deaths (counterfactuals)	Meslé, M. et al. (2021). Estimated number of deaths directly averted in people 60 years and older as a result of COVID-19 vaccination in the WHO European Region, December 2020 to November 2021. <i>Euro Surveillance</i> , 26(47). https://doi.org/10.2807/1560-7917.ES.2021.26.47.2101021

Appendix F

Table 1

Different FLICC Strategies used per Participant and the Total Times each Strategy is Used

Fallacy	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	Total
Fake experts		x	x			x		x	x	x						x	7
Logical fallacies		x	x			x		x		x	x	x			x	x	9
Impossible expectations	x	x	x	x		x	x	x			x	x	x	x	x	x	13
Cherry-picking	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	16
Conspiracy theory	x		x	x	x			x			x				x		7

Table 2

Number of times a FLICC strategy is used per Justification

	Necessity			Safety		Effectiveness	
	Risk perception	General threat	Alternative solution	Long term	Side effects	Against illness/death	Against transmission
Fake experts	-		1	-	3	-	-
Logical fallacies	3	2	6	1	3	4	-
Impossible expectations	-	-	-	9	11	6	9
Cherry-picking	16	2	2	1	11	3	6
Conspiracy theories	-	-	-	-	-	-	-