

The disinformation landscape of the future: a qualitative perspective

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Supervisors

Dr. Anne Dijkstra

Dr. Sikke Jansma

Student

Julian Rossing

s2908492

Abstract

Introduction: Disinformation has divided societies and eroded trust between citizens and governments. It has attacked democracies and the ability to tackle acute health threats such as the coronavirus and measles. This study seeks to offer a reflection on how the disinformation landscape could develop, how technology will influence this landscape, and which current methods to counter disinformation are expected to remain effective.

Methods: With semi-structured interviews, the reflections of 18 participants were collected. The data were analysed by means of thematic analysis.

Results: Participants reflect that society will become increasingly sceptical of experts and science, in a way that has not been seen before. False narratives are increasingly converging between domains and the landscape is shifting towards a society that increasingly operates on the basis of different facts. The influence of AI implies that researchers, the media and the general public will be unable to keep up with new issues. Advancing AI will likely empower disinformation actors at a much higher pace than it will empower those who want to counter it. Meanwhile, the development of personalized disinformation and avatars will increase the credibility of disinformation. Media literacy/inoculation has been identified as an effective method to counter disinformation, teaching society to identify disinformation content and strategies. This would work best in combination with debunking and regulations in the short term.

Keywords: disinformation, data collection, qualitative study, artificial intelligence, inoculation theory

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1. Introduction

Disinformation has divided societies and eroded trust between citizens and the government. It has been used to attack democracies and the ability to tackle acute health threats such as the coronavirus and measles (European Commission, 2022). The COVID-19 pandemic made it very clear how disinformation can be a direct threat to citizen health. During this time in the United States, false information was spread regarding the possible use of disinfectants to prevent a COVID-19 infection (Gharpure et al., 2020). As a result of this, the United States Centers for Disease Control (CDC) reported an increase in calls to poison centres regarding exposure to household infectants (CDC, 2020). To measure the effects, a survey was held among 502 adults in the United States, which found that 39% of respondents engaged in dangerous behaviour such as washing food with bleach, applying household cleaning products directly to their skin, and purposefully inhaling and ingesting disinfectants with the aim to prevent a COVID-19 infection (Gharpure et al., 2020).

Disinformation is not only a direct threat to health, as it also influences the topic of climate change. In February 2022, misinformation and disinformation were mentioned as key barriers to the possibility to adapt to climate change (IPCC, 2022). Disinformation will continue to stall climate change tackling efforts and will allow global temperatures to continue to rise, an issue that is increasing within Europe (EDMO, 2022).

The arrival of AI-generated disinformation brings unforeseen challenges. Without the right training or tools, humans are only able to recognize false content in 54% of instances (Bond & DePaulo, 2006; Rubin et al., 2016). It is likely that this percentage will decrease over time as AI-generated disinformation develops. As AI has such big and unknown effects on the disinformation landscape, it is worth reflecting on the development of the disinformation landscape, under the influence of AI. In addition, it is worth asking which strategies will remain effective as AI develops over time. AI-generated disinformation is relatively new and is now being used on a scale as never seen before. For this, there is not a lot of research on this topic and the threats are relatively unknown. There is need for a continuous reflection on this, in order to keep up with the changing disinformation landscape and set new research directions.

This leads to the following *research question*:

1. How will the landscape of disinformation develop in the coming years, according to disinformation professionals?

This leads to the following *sub-questions*:

1. What are the most important trends identified by disinformation professionals?
2. How do disinformation professionals reflect upon the influence of AI development on the disinformation landscape?
3. Which strategies to combat disinformation will remain effective according to disinformation professionals?

2. Literature review

The disinformation landscape within democracies

Disinformation has a great effect on established democracies. The United States is a good example of a country influenced by disinformation. Here, it has divided society and made democratic decision-making a major challenge. According to a NPR Survey, 64% of U.S. citizens believe that democracy is in crisis (Rose & Baker, 2022), and 72% of US citizens express that political instability is a bigger danger to the country than external adversaries such as Russia, Iran or China (Rose & Baker, 2022). A major reason for this decrease in confidence in the political system is the increase in disinformation, aimed at disrupting democratic decision-making.

As a result of false narratives, the public trust in the US democratic system declined. According to Yoon (2023), just 20% of voters feel confident in the integrity of the U.S. election system. This is in part, because the disinformation comes from within. Since his lost election in 2020, former president Donald Trump has continuously made efforts to spread unfounded theories and conspiracies (Yoon, 2023). Recent polls from The Associated Press-NORC Center for Public Affairs Research show that 57% of Republicans believe that Joe Biden was not legitimately elected president (Yoon, 2023). A poll by Monmouth University found that 30% of respondents think that Biden won the 2020 election due to voter fraud, while 59% say he won the election in a fair way (Kamisar, 2023).

Disinformation has also increasingly influenced the continent of Europe over the past years. Disinformation in Europe has caused an increase in violent attacks, hate speech, scepticism in governments and difficulty to separate fact from fiction. The COVID-19 pandemic marked a turning point for disinformation for anti-establishment actors, extremists and conspiracy theorists (Jahangir, 2023). In the Netherlands, COVID-19 conspiracies have plagued citizens over the last years, causing violent attacks on vaccination centres and making the public increasingly sceptic towards the government, scientific communities and the media (Jahangir, 2023).

In Germany, far-right groups have adopted racist and anti-Semitic theories, which play a role in disinformation in the country. Germany was the main Western country targeted by Russian propaganda before the Russian invasion of Ukraine. Events surrounding migration, gender issues and climate change in other countries intensified disinformation in Germany (Serrano, 2023). In Spain, disinformation actors mix facts with disinformation, exploiting legitimate topics and concerns, making it increasingly difficult for people to separate information from disinformation (Vicente, 2023). In Lithuania, the majority of disinformation encountered originates from Russia. This disinformation aims to undermine NATO, the EU, and the West in general, while promoting Russian authority and legitimacy (Mays, 2023).

Defining disinformation and misinformation

As misinformation and disinformation are often both used to describe false information, these terms should be clarified further. There is no single definition of misinformation that has been used by scholars (Treen et al., 2020). Some refer to the definition stated in the dictionary, which defines misinformation as “false, inaccurate, or misleading information” (Karlova & Fisher, 2012). Others (Cambridge Dictionary, 2019; Oxford Dictionaries, 2019) address that misinformation is “the act of giving wrong information about something”.

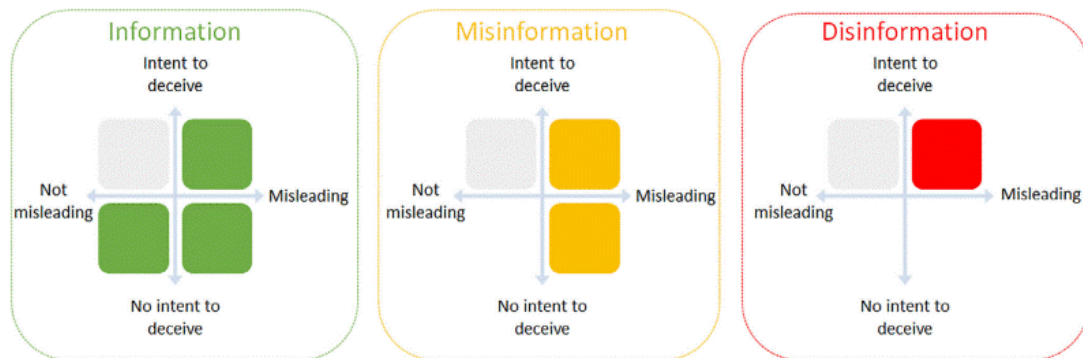
These definitions have in common that they consist of false, inaccurate, or misleading information. The main difference between various definitions, however, concerns the intention behind the information. While some definitions hold that misinformation is intended to be spread and deceive the reader (Cambridge Dictionary, 2019; Oxford Dictionaries, 2019), others argue it is mistakenly created and spread, with no intention to mislead (John Hopkins Sheridan Libraries, 2019; University of Michigan Library, 2019).

A term that closely relates to misinformation, is the term disinformation. Disinformation is mostly defined as deliberate false information, created to and spread to mislead the reader (Dictionary.com, 2019; Oxford Dictionaries, 2019). Disinformation itself might not be false, but deliberately presented in such a way that it deceives an audience (Fallis, 2009). Karlova and Fisher (2012) define the terms misinformation and disinformation similarly. They define both misinformation and disinformation as informative, possibly complete, possibly true, and possibly current.

The difference is that misinformation is not meant to be deceiving, while disinformation is meant to be deceiving. Van der Linden (2017) distinguished the terms in an equal manner, defining misinformation as a result of human error, while defining disinformation as purposefully harming or deceiving. Media often use the definition of *fake news*, described by Cornell University Library (2023) as “fabricated information that mimics news media content in form but not in organizational process or intent”. The difference between information, misinformation and disinformation is outlined in figure 1.

Figure 1

Hierarchy of information, misinformation, and disinformation (Treen et al., 2020)



The increase in false information due to social media

Social media plays a big factor in the increase of disinformation over the last years. Research indicates that social media platforms contribute to the spread of disinformation narratives. Petersen et al. (2019), for instance, found that social media sites feature climate opposers in 49% more articles than actual scientists, and mainstream media feature climate deniers 1% more than climate scientists.

Consequently, the public is confronted with more messages based on disinformation than based on scientific research, and might therefore create a bias toward the sincerity of climate change measures. Similar results were found during the 2016 US presidential election, during which false news websites were represented much more on social media than traditional media websites (Alcott & Gentzkow, 2017). The influence of false information on social media has major consequences, and it has even been suggested that Donald Trump would not have been elected if not for fake news (Parkinson, 2016).

Social media companies are also responsible for the increase of disinformation on their platform. It has been shown that social media platforms are dependent on their revenues from organizations and individuals spreading disinformation. A recent study by Silverman et al. (2022) shows that Google gets income from advertisements of some of the worst climate change disinformation promoters on the internet in Europe, Latin America, and Africa. This idea is supported by a study done by Papadogiannakis et al. (2023), who found that well-known ad networks, such as Google and IndexExchange, have a direct advertising relation with more than 40% of websites that distribute fake news.

The push of disinformation on social media would not be such an issue, if people were able to distinguish fact from fiction. However, this is not the case. Social media users increasingly face difficulty in distinguishing fake news (Allcott & Gentzkow, 2017; Au et al., 2022; Borges & Gambarato, 2019). Distinguishing fact from fiction becomes more complex because of the rise of new technologies. It has been argued that social media facilitates the fast spread of disinformation, and that fake news receives higher levels of exposure (Timmer, 2017), in part due to the involvement of bots (Vosoughi et al., 2018). This is a problem, because various studies have shown that humans are unable to recognize fake news (Bond & DePaulo, 2006; Rubin et al., 2016). Without the right training or tools, people score 54% on tasks that ask them to distinguish truth from deception, which is only marginally better than chance. Meanwhile, questions regarding what can be done to counter the effect of fake news remain unanswered (Au et al., 2022), and the scientific evidence on the use of certain tools is limited (Paredes et al., 2021).

The influence of AI on the disinformation landscape

The effectiveness of disinformation will likely increase as technology advances. This is a problem, as humans are already unlikely to recognize it. Without the right training or tools, humans are only able to recognize false content in 54% of instances (Bond & DePaulo, 2006; Rubin et al., 2016). It is likely that this percentage will decrease over time as AI-generated disinformation develops. Tools like Midjourney, which came out in July 2022, created an image of the pope in a puffer jacket and the “arrest” of Donald Trump. In parallel, tools such as ChatGPT allow for communication with human-like AI. AI influences disinformation in various ways. First, AI creates new opportunities to manipulate text, image, video and audio content (Bontridder & Pouillet, 2021). Second, AI enhances user engagement, which contributes to the rapid spread of disinformation (Bontridder & Pouillet, 2021).

The main threats currently associated with AI techniques are (1) user profiling and segmentation, (2) hyper personalised targeting, (3) deepfakes, and (4) autonomous AI-systems (Kertysova, 2018). With (1) user profiling and segmentation, AI will become increasingly able to identify individual’s unique characteristics, needs, beliefs and vulnerabilities. Disinformation actors will be able to generate personalised content, and target those who are highly vulnerable. User profiling and segmentation make room for (2) hyper personalised targeting, as AI will be able to rapidly create automatic content based on personal characteristics. Natural Language Generation tools can automatically generate content for unique users (Kertysova, 2018). (3) Deepfakes – digitally manipulated visual or audio materials – are becoming mainstream. Several instances have shown how AI-generated videos can show politicians making statements. In May 2019, US House Speaker Nancy Pelosi was targeted, appearing in a deceptive video, in which she appears to slur her words as if she was drunk (Kertysova, 2018). As datasets get bigger, AI systems will improve and might eventually succeed in replacing

human oversight. As the next generation of tools focus on the ability to understand human language, reasoning and context, it is not unthinkable that AI will soon be able to adapt content to different audiences (Kertysova, 2018). It is likely that artificial intelligence and machine learning will be able to create fakes that are indistinguishable from reality in the future, in contrast to the simple language and easily refutable claims made now.

Strategies to counter disinformation

Most research on methods to counter disinformation is supported by cognitive psychology, which examines how individuals react to disinformation. A first approach for countering disinformation is *inoculation* or *prebunking*; countering disinformation with facts and correct information. The aim is to intervene before disinformation is received (Treen et al., 2020). Inoculation theory, originally developed by McGuire in the 1960s, proposes that individuals can become immunized against persuasive attacks, similar to how individuals can become immunized against viruses (McGuire, 1964). McGuire and Papageorgis (1961) argued that it would be more effective to expose individuals to a weakened dose of a persuasive attack, and pre-emptively refute this attack, than using the more traditional approach of trying to change their attitudes by using facts (McGuire, 1964).

An inoculation message consists of two aspects: *threat* and *refutational pre-emption*. The threat aspect consists of making the individual aware that a persuasive attack is coming, by way of warning individuals that political actors might aim to mislead the audience attitude on issues such as climate change or energy technologies (Cook et al., 2017; Bolsen & Druckman, 2015). Refutational pre-emption consists of providing individuals with tools and arguments to refute persuasion attempts, providing the receiver with information that could help strengthen their attitudes against persuasive attacks (Compton & Pfau, 2005).

Van der Linden et al. (2017) first tested inoculation theory in the context of climate change. They found that warning people prior about motivated attempts to spread misinformation helps remind the public about the scientific consensus of a topic. The results of the study demonstrated that the applicability of inoculation theory also applies to real-world issues (Traberg et al., 2022). Cook et al. (2017) found that inoculation is an effective method for “neutralizing” the effects of disinformation. The quantity of misinformation online makes it almost impossible to inoculate people to every individual piece of information. Therefore, scalability is an important tool for countering misinformation (Roozenbeek & van der Linden, 2018).

In their early theorizing stages, McGuire and Papageorgis (1961) distinguished two different forms of refutation content: *refutational-same* messages and *refutational-different* messages. Refutational-*same* messages inoculated individuals with specific (mis)information that they would later be confronted with, whereas refutational-*different* messages inoculating participants with information that they would not directly be confronted with. For refutational-*same* inoculations, the message contains misinformation on the exact topic.

For refutational-different inoculation, the “attack” consists of different climate-related disinformation, such as misinformation on how reducing carbon dioxide levels does not influence the climate (Roozenbeek & van der Linden, 2018). Earlier research has suggested that inoculation messages were more effective when individuals were exposed to the same arguments that were later refuted (Watts & McGuire, 1961; McGuire & Papageorgis, 1961). This means that it could be argued that inoculation should focus on teaching individuals to resist the exact information that they are trained to resist. However, if inoculation could also offer protection against new information, the scalability of inoculation interventions could be increased (Traberg et al., 2022).

Cook et al. (2017) used the same piece of misinformation as van der Linden et al. (2017). They tested whether inoculation messages focused on exposing misleading arguments in misinformation would also cause resistance in attitude. The research found that warning participants about the misinformation strategy of using *fake experts* in the context of the tobacco industry caused resistance in attitudes against the Oregon Global Warming Petition (a petition challenging the general scientific consensus on climate change). This proved to be an interesting finding, because it suggested that individuals could be inoculated against the *strategies* used in misinformation, providing a wider level of protection. Studies have found that inoculation messages can cross-protect individuals against persuasion on related attitudes that are untreated (Traberg et al., 2017). This effect is also known as the *blanket of protection* (Compton et al., 2021; Parker et al., 2016). Parker et al. (2012) showed that inoculation messages addressing unprotected sex also protected against binge drinking. For this, Traberg et al. (2022) theorized that the exposure of misleading *strategies* underlying misinformation about climate change might also offer protection against misinformation on other topics that use equal strategies. The main disadvantage of this strategy, is that its effectiveness depends on knowing what type of disinformation will be distributed.

A second approach for countering disinformation, is responding to disinformation after it has been received (Benegal & Scruggs, 2018; Kahan, 2017; Lawrence & Estow, 2017). This is called *debunking*. However, the application of this strategy has shown evidence of the so-called “backfire effect”, whereby audiences that receive correcting information only become more convinced of their original position (Cook et al., 2015; Garrett & Weeks, 2013; Nyhan & Reifler, 2010). Correcting disinformation after it is spread comes with various other challenges, such as the challenges that (a)

fact checks are unlikely to reach each individual exposed to misinformation, (b) getting individuals to believe checked facts is difficult, (c) effective interventions are difficult to scale to a population level, (d) testing the effectiveness of interventions outside of the laboratory setting can be challenging, and (e) correcting misinformation does not always nullify the effect, a phenomenon known as the *continued influence effect* (Roozenbeek et al., 2022).

Researchers are examining how AI can be used to increase the effectiveness of debunking. AI techniques are explored to detect false, inaccurate or misleading content. (Bontridder & Poulet, 2021). Machine learning makes it possible to differentiate between articles containing information or disinformation. However, large amounts of data are necessary, which can be difficult to obtain (Bontridder & Poulet, 2021). In addition to this, the output lacks argumentation and is greatly affected by biases in the dataset (Bontridder & Poulet, 2021; Akers et al., 2018).

AI can be used to detect factual inaccuracies, by way of comparing content of articles with external evidence. However, this is better performed by human fact-checkers, because AI struggles interpreting the nuances of natural language (Bontridder & Poulet, 2021; Akers et al., 2018). The detection of misleading styles can also be done through machine learning. However, the style is not always correlated with accuracy of the content (Bontridder & Poulet, 2021; Akers et al., 2018). AI can also assist through the analysis of metadata – e.g. the profile and attributes of the sharer. However, AI is not yet suited to replace human intervention. Textual analysis programs that are trained to identify disinformation are sensitive to false negatives or positives (Marsden & Meyer, 2019).

A third strategy used to counter disinformation, is the implementation of regulations. Different governments within and outside of Europe have introduced regulations to counter disinformation, despite a report put together by the European Commission that argues that these regulations are “a blunt and risky instrument” (European Commission, 2018). AI has also been leveraged to regulate content (Marsden & Meyer, 2019). (1) Filtering of content, (2) removing of content, (3) blocking of content, (4) prioritization or deprioritization of content and, (5) disabling of accounts are measures AI can assist with.

According to Nucci et al. (2021), researchers on the Fandango project – which focuses on software tools that help journalists and fact-checkers identify and fight fake news – it is naïve to think technology can completely solve the problem of fake news. According to Nucci et al. (2021), “fake news is not a mathematical question of algorithms and data”, but rather a “very good philosophical question on how we deal with the truth”. Nucci et al. (2021) nevertheless argued that technology can “help improve transparency around fake claims and misinformation”. According to Nucci et al. (2021), the issue not only lies in detecting fake news. The problem might also be a lack of trust and

critical thinking. People are losing trust in traditional media and institutions, which is an issue that technology cannot solve (Nucci et al., 2021).

Actors involved in spreading disinformation

In their book, *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming*, historians Oreskes and Conway (2010) explain how a small but loud group of researchers succeeded in misleading the public about the truths around global warming, tobacco, DDT, and other important topics for decades. The medical community possessed research documents showing the negative effects of smoking in the '50s, long before it was known among the public. Once studies showing harmful effects spread among the general public, tobacco companies purposefully spread doubt among consumers. The companies accomplished this by paying researchers to “prove” that smoking was not that harmful.

Various disinformation campaigns by these *Merchants of Doubt* kept alive a fake debate, stoking public fears about the economic consequences of taking climate action (edf.org, 2015). The book exposes how fossil companies pay scientists to question the existence of climate change, how petitions claim that scientists do not believe in climate change, and how “independent” think tanks are, in reality, just front groups for the fossil industry (Oreskes & Conway, 2010).

The main strategy used by deniers is to create doubt in the minds of the public. As explained by Oreskes and Conway (2011), this type of strategy was used by the tobacco industry to deny the links between smoking and cancer. Begley et al. (2007) described “a paralyzing fog of doubt around climate change”, referring to three main categories of doubt: doubt about the existence of climate change, doubt about the urgency of climate change measures, and doubt about the expertise of climate change scientists (Boussalis et al., 2018; Dunlap & McCright, 2011; Harvey et al., 2018; Moser, 2010).

Bjornberg et al. (2017) mentioned six categories of actors and organizations that spread misinformation on climate change. These six categories consist of (a) scientists, (b) governments, (c) political and religious organizations, (d) industry, often coal and oil, (e) media (particularly right-wing media), (f) the public (in particular conservative white males).

Relevance of this study

The spread of disinformation develops over time, due to technological innovation. As we are in the middle of these developments, very few literature is available on this topic. There is a need for a continuous reflection on the development of disinformation under the influence of AI, because in order to keep up with these changes, new research directions are continuously needed. This makes it interesting to reflect on what is currently happening in this area.

3. Method section

Research design

This research was ethically approved by the Ethics Committee of the faculty of Behavioral, Management and Social Sciences of the University of Twente, on June 12, 2023, under approval number 230925. Data were collected during one-on-one, semi-structured interviews via Microsoft Teams. Semi-structured interviews were used, because qualitative research in the form of semi-structured interviews provides a high potential to reveal new insights on the topic, as it allows for alternative views that are not thought of before (Gioia et al., 2012). This fits well within this study, which seeks to explore expert reflections on the abstract and rapidly evolving topic of disinformation. A quantitative or fully-structured qualitative interview would not offer experts the opportunity to deliver insights that are completely new to the researcher. The study consists of 18 interviews. These interviews were recorded and the transcripts were anonymized, giving the participants a code name and removing all the data that could allow participants to be identified. Interviews were conducted in English.

Recruitment of participants

The participants consisted of professionals working within the field of disinformation. These individuals were selected using various criteria. To be considered a professional, participants had to work with disinformation professionally. This could be in either an organization or in an academic setting. Some participants were academic researchers on disinformation, others worked as analysts for disinformation debunking organizations. The aim was to find individuals that had fulltime work experience within the disinformation area. Professionals selected originated from both European countries, as well as the United States. To get in contact with these professionals on disinformation, LinkedIn was used. LinkedIn provides access to searching professionals based on their job title and experience, which increases the likelihood of finding professionals working on disinformation. Searching for the term ‘disinformation’ and filtering on ‘persons’ on LinkedIn offered a 100 pages with 10 individuals on each page describing some experience with disinformation. From these 1000 individuals, the aim was to obtain between 15 and 20 participants. Out of 50 professionals that were contacted, 21 agreed to participate. In the end, 18 actually participated, as 3 stopped responding or had to reschedule to a date that did not fit the study timeline. Individuals that responded were selected based on their enthusiasm and willingness to help. After contacting an individual, they were briefed in a LinkedIn message, to get an idea of what would be expected of them. After agreeing to participate in an interview, they were asked about their availability and were send a Microsoft Teams calendar invite. An overview of the characteristics of participants is given in the table below.

Table 1*Demographics of the participants*

Participant	Gender	Country	Job title/focus area	Degree
1	F	The United States	Disinformation/propaganda researcher	PhD
2	F	The United States	Disinformation analyst	MA
3	M	The United States	Researcher disinformation	PhD
4	F	The United States	Visual analysis, modern disinformation	PhD
5	F	Germany	Disinformation, platform governance	PhD
6	M	Estonia	Economics & policy, disinformation	MSc
7	M	England	Public affairs, political Communications, disinformation	BA
8	M	England	Intelligence analyst, disinformation	MA
9	M	Romania	Media literacy & counter disinformation	PhD
10	F	The United States	Disinformation, digital literacy	BA
11	M	Czech Republic	AI/ML, disinformation	Gymnasium
12	M	Scotland	Disinformation analyst	MSc
13	F	Italy	Disinformation analyst	
14	M	Germany	Media regulation and governance	
15	F	Belgium	Intelligence analyst	IntM
16	M	Germany	Disinformation, hate speech	MSc, MA
17	M	France	Disinformation	PhD (student)
18	F	The United States	Disinformation	MA

Materials

Microsoft Teams was used to record and automatically transcribe the interviews. As the automated transcripts were partly incorrect, the final audio transcription was done by listening to the recordings and improving the automated transcripts in Microsoft Word. ATLAS.ti was used to analyse the transcribed interviews. R Studio was used to calculate Cohen's Kappa.

Instrument and procedure

For this study, an interview protocol was created (Appendix A). This protocol consisted of three sections. The first section consisted of questions about the perceived trends and developments in the disinformation landscape. The questions in this sections were asked, to get an overall idea of how the professionals reflect on the developments, without limiting them with specific directions. The second part consisted of questions related to the perceived influence of technology on the disinformation landscape, as technology is arguably one of the biggest factors of influence to disinformation. Where the first question left the direction open, this section aimed to get more insight on the influence of technology. The third section consisted of questions focused on the perceived effectiveness of

strategies to counter disinformation. The study wanted to discover how experts reflect on the effectiveness of counter strategies, as the landscape changes, under the influence of technology.

At the start of the Teams meeting, participants were briefed about the purpose of the interview. They were also informed that the interview would be recorded, transcribed, anonymized, analysed and deleted. Participants were then asked to give informed consent before the start of the recording. After consent was given, the interview started and participants were asked to explain their background in disinformation work and or research. After these steps, the participants were asked about their reflections on the future of the disinformation landscape. When participants struggled to find a starting point, they were given topics such as *trends*, *challenges* and *actors* to focus on. Then, participants were asked to reflect on which technological developments would change the disinformation landscape, and how. Lastly, participants were asked which strategies they predict to remain effective. The goal was to let participants speak freely as much as possible, to perform inductive analysis in the later stage.

Data analysis

Due to the open-ended nature and the qualitative, semi-structured approach, thematic analysis in ATLAS.ti was used to code the data of the transcribed interviews. Thematic analysis does not require the theoretical and technological knowledge of other qualitative approaches and offers an accessible form of analysis, suited for those early in their research career (Braun & Clarke, 2006). Braun and Clarke (2006) and King (2004) argue that thematic analysis is a useful method for examining the perspectives of different participants, highlighting similarities and differences, and generating unanticipated insights. This seemed the correct choice due to the explorative nature of this study. The data approach followed The SAGE Handbook of Qualitative Research in Psychology (Rogers & Willig, 2017).

First, the data were closely examined to identify reoccurring and common topics, patterns and ideas to obtain a basic perspective on the views, knowledge, and experience of the participants. After examining the responses at various times, the collected data were distributed among groups and identified by a code, based on a codebook (Appendix B). These codes provided a decent overview of the main points and patterns identified in the data. The codes were then organized by theme, combining multiple codes under a theme. Table 2 provides an oversight of the themes and sub themes. The main themes originate from the research questions. The sub themes originate from the inductive analysis, meaning that they were determined by the data. This way, this study combined deductive with inductive analysis. Cohen's Kappa in R was used to measure inter-coder reliability, resulting in substantial agreement, $\kappa = .61$.

Table 2*Themes and sub themes*

Themes	Sub themes
The changing landscape of disinformation (trends)	Increasing scepticism Convergence A society that operates on a different set of facts
The influence of artificial intelligence	AI-generated disinformation Increased empowerment of disinformation actors Personalized disinformation
The most effective strategies to counter disinformation	Media literacy, prebunking or inoculation Leveraging AI to debunk Regulations
Challenges	Keeping up with disinformation strategies Convincing politicians to not tear up the playing field Convincing policymakers about the urgency Have policymakers up to date with current developments
Actors	Private actors: extremists, citizen journalists, PR firms State actors: China, Russia, Iran, the West, elites and politicians

4. Results

The changing landscape of disinformation

Each participant was asked to reflect on the changing landscape of disinformation in the coming years. This section discusses the most relevant developments in the changing disinformation landscape. Since the next section will focus on AI-related answers, this section will focus on answers that are not related to AI.

A first non-AI trend within the landscape of disinformation is that was often referred to by the participants is that of **increasing scepticism**. Participants indicated that this has been especially the case since the Covid pandemic. One participant (P12/0:03:34) reflected on the increased scepticism by stating “The pandemic has basically created a vulnerable population who are sceptical of experts, who are sceptical of science, in a way that we wouldn’t have necessary seen before”. This participant (P12/0:03:01) also mentioned: “Yeah well, I think disinformation, it certainly has become a bigger topic than it has been in recent years, and largely because of social media and online media. As people are getting more of their news from social media sites such as Facebook, Twitter, we are seeing less guards in terms of the type of information that is out there.” Another participant (P7/0:07:25) stated: “The main change in the landscape is that we have moved from a world where you have a core base of truth, a world where you have facts and opinions, but truth is truth and opinions were opinions, to a world where everybody has their version of the truth. And unfortunately now, in the way that social media, and algorithms and business models work, it is pushing this further and further away.”

The participants made a connection between increased scepticism and **convergence**: a parallel of disinformation narratives between various domains, and the adoption of disinformation narratives from other countries. Disinformation actors take narratives from different domains and countries to create overall doubt about government policy. It has been observed that, for example, climate change deniers are also against intervention in the war between Russia and Ukraine. One participant (P16/0:02:36) stated: “Actors that would normally stay in the climate domain, or have specific focus on issues related to migration, that these actors have adapted to broader conspiracy narratives, especially around elites, let’s say the great reset for example, then they adapt these conspiracies to their domain”. Another participant (P17/0:06:59) stated: “Based on the research we are doing, in France, we have a new community appearing on the climate sceptic side. This community imports the same narratives from the US. Before 2020, no one was really using this kind of argument in France and now are starting to see something that is brand new. Another participant (P5/0:14:02) added: “Sometimes, people converge. For example, in Germany, people are still against vaccinations and have all these conspiracy theories, they also are completely against the Ukraine war, because they also say it’s all the same, big America, a big lobby that is all pushing us. So there is a convergence.”

The shift from a society that operates on basic facts to **a society that operates on the basis of alternative facts** was also mentioned. One participant (P15/0:02:43) stated: “The overarching idea is that there is going to be a complete collapse of shared reality. I don’t want to sound too alarmist, but I think that a common understanding on which social relations are built are generally collapsing. Not just because of generative AI, that is just a drop in the ocean of things that are happening, but I think you’ll have to assume that people will operate from a different set of facts.”

It was expressed that this operating on a different set of facts gives disinformation actors **the possibility of creating doubt around allegations or deny these allegations** altogether. One participant (P11/0:05:24) stated: “What I am trying to get to is that we are getting into a phase is that everything can be called into question. If I pull up an image that would be compromising against you, you can just say “oh yeah, that looks fake”. It will be very hard now to determine who is on the right side. This phenomenon is called the liars dividend. We are getting there and this is the most interesting aspect. I’m not sure if it will be able to get back from there. The question is “can we go back?” I’m not sure.”

The influence of AI on the disinformation landscape

Each participant was asked to reflect on the influence of artificial intelligence on the disinformation landscape. A general trend discussed by participants of the study was the use of **AI-generated disinformation**. One participant (P8/0:02:57) stated: “I think AI and the ability to quickly create disinformation is going to be massive.” When it comes to the type of disinformation that is predicted to increase, **video-based and audio-based disinformation** were often mentioned, in the form of deepfakes and generated voices.

When asked what type of AI-generated disinformation was predicted to increase, one participant (P9/0:0:13) said: “But I do think that generative AI is a part of what we are looking at looking forward, so less about creating convincing content that is text based or image based, but moving toward video and audio based”.

Participants mentioned **the inability to keep up with developments** as a major aspect within the future disinformation landscape under the influence of AI. Researchers and the media will not be able to keep up with every single issue. Where readers of scientific papers or the news are still relatively up to date with new disinformation tactics, staying educated will become increasingly more difficult. One participant (P1/0:03:06) explained: “So right now we have a small number of deepfakes that are coming up, specifically political deepfakes, but we see the news covers that. You know, look at this fake video of Joe Biden roasting Donald Trump, and everybody kind of comes out saying: “look it is fake, look it is crazy”, but it is amazing how far the technology has come. But once it becomes more prolific, and once it becomes an everyday kind of bombardment of disinformation in visuals, the media has other stories. They are not going to be able to keep up with every single issue.”

Another important aspect mentioned by participants, is that **AI will likely empower disinformation actors at a much higher pace than it will empower those who aim to counter it**. One participant (P12/0:05:20) explains: “AI will empower disinformation actors at a much higher pace than it will empower those who want to leverage AI to use it to debunk disinformation.” This same participant (P12/0:05:26) later adds: “The more tools we get to debunk disinformation, the more actors have access to tools that can refine their disinformation strategies.”

Another development that AI will bring is **personalized disinformation**. As one participant (P11/0:11:17) stated: “At the same time, what is going to be problematic, is personalization of fake news. In the Czech Republic, we see a phenomenon of chain fake hoax emails. Mostly senior citizens are receiving mass quantities of disinformation emails. Senior citizens are not really the most prepared, they often fall for it.”

Personalization of disinformation has also been linked to the use of **avatars**. One participant (P4/0:03:14) explains: “So one of the things that AI could do, is to create a stronger emotional resonance for disinformation, and when you have an audience that is already sort of jaded to the truth, those forms of AI and avatar creation can help that disinformation gain a stronger traction that people won’t be ready for.” This respondent (P4/0:03:30) explains: “How that is happening now, with the creation of emotional resonance with the use of ChatGPT and the use of avatars is that that creates a symbol and a figure that appears more closely human, on a website or embedded within a chat feature, that allows a human to feel like they are talking to a person, and that talking to a person as well as an avatar symbolism, can allow individuals to feel that stronger emotional resonance.”

Future web developments such as the decentralized Web 3.0 and the Metaverse were expected to present additional challenges to identify and counter disinformation. These web environments will further anonymize users, making it a bigger challenge to identify disinformation actors.

Strategies to counter disinformation

Participants were asked which strategies to counter disinformation they deemed most effective and future proof. Of the 18 participants, 14 mentioned a long-term strategy in the form of **media literacy, inoculation or prebunking** as one of the most effective measures to counter disinformation. The participants added that media literacy and inoculation as a strategy is best used to counter disinformation in the long term. One participant (P12/0:15:02) stated: “It is definitely going to be a combination. There is no magic. But if I had to pick one, I think it does stand out, inoculation, media literacy, protecting our future generation, teaching them to critically analyse information, being able to assess what is a reliable source, and what is a trustworthy source.” Another participant (P11/0:0:16) explained: “So I think the obvious answer is education. If we educate people early enough, for example starting in elementary school, and going through high school, I think that will help us a lot.” According to these participants, it is important to provide media literacy and education at a young age.

One participant (P8/0:0:16) explains: “We are talking about a young generation that will substitute current generations. Till then, we should focus on amplifiers, debatable information that you can legally share and can’t share. A big part of the problem is amplifying it.”

This means that there is also room for **debunking**, mainly for the short term, aimed at current generations. Because debunking offers various challenges, different participants have stated that it is not as effective as prebunking in the form of media literacy and inoculation. However, it is stated that a combination of debunking in the short term and prebunking in the long term could be effective. One participant (P15/0:12:05) stated: “Inoculation works, debunking after the fact does not work as much. So in the future, I think is going to be super important to do prebunking. Prebunking is often conceptualized in media literacy and education, and this is really important, I know in the Finnish education system, they are really drilling down on that, and studies show that it has a good effect on how people engage with media, but I do think that that is not enough. I think we should leverage the same technology that can be used to spread disinformation to counter it.” Another participant (P5/0:20:46) added: “I think it is a very important tool, there is always debunking and fact-checking, but it takes a lot of time. I see journalists fact-checking and it takes them two or three days. If some fake video comes from the far right and they doctored the video, the reaction time is always 24 to 48 hours and how many people have seen that? And the worst is, the fact checking doesn’t even reach the same amount of people that have saw the video.”

Participants also explained how **artificial intelligence to counter disinformation** should be leveraged to improve efficiency of debunking, and to have a better understanding of what AI-generated disinformation will bring. As participant (P12/0:18:49) stated: “It’s like an arms race against those who want to use information for their own purposes and people who want to pursue truth, fact and reason. In terms of staying ahead, we are not turning a blind eye to AI, we are seeing how we can use it in our processes, make our work more efficient, make our work faster. It’s about not turning a blind eye to these things and being open to see how they can implement into your workflow.”

Finally, participants mentioned **regulations**. However, imposing regulations comes with various challenges, especially in polarized political climates such as that of the United States. One participant (P15/0:06:16) stated: “In the United States, it is obviously different from Europe. There is this inherent fear of being seen as a censor. No matter how much people know it politicises, no matter how much people know that it’s detrimental to the coherence of a society, there is this real fear in the US of being perceived as tyrannical. In the US, laws prohibit government officials to contact social media officials, even though they are not forcing social media companies to silence messages that go against their agenda, but just to counter false information.”

A possible solution mentioned is to focus on manipulative tactics, instead of content. One participant (P14/0:20:18) stated: “Far right says civil society that tries to combat disinformation is just trying to limit free speech, so it is important to be clear what we mean by disinformation. When do we refer to content, when do we refer to manipulation tactics. Especially the content part is quite difficult, because to really say what is true and what is false is quite a difficult concept, and this is also difficult to apply in regulations. I think we should rather go into a system based approach where we specifically look into manipulation, and less into specific pieces of content.”

Disinformation actors

Participants were asked to identify which disinformation actors would be most prominent. A distinction can be made between **private actors** and **state actors**. Private actors might consist of **extremists, crime rings, citizen journalists, and PR firms** that make a profit from creating and distributing disinformation. One participant (P8/0:10:14) stated: “A few years ago, Meta identified various trends. One was an increasing involvement of PR firms, the disinformation for hire. These share false information about competitors. The private sector is no longer safe from disinformation.”

As mentioned before, **influencers** with a reach also play a big part in spreading disinformation. One participant (P16/0:02:43) stated: “Actors that have a very broad reach, like influencers, have contributed to the mainstreaming of specific, very extremist ideas, but also related are conspiracy narratives. This is a huge challenge, because look for example at QAnon, it used to be a small movement in the US, but now we also have it in Europe, there are ten thousands of people who you could call believers.”

State actors that are mentioned are **China, Russia, Iran, the West, and elites/politicians**. However, the availability of technology to create disinformation means anybody could be behind it. One participant (P8/0:10:14) stated: “Russia and China, but also Iran and even the West have pushed certain information to pursue its needs and its objectives.” Another participant (P1/0:06:10) stated: “Specifically China and Russia, probably Iran, but in the larger context, it genuinely could be anyone behind it. Another participant (P4/0:01:19) mentioned: “I see foreign actors trying to influence established democracies or established nations generally, and try to create enemies within the nation, as well as more general instability for the truth, as well as standard protocols. I think it will be hard to tell who is on who’s side, and what established nations or locations and communities will be under attack in the near future.”

Challenges

Participants were also asked about the biggest challenges they identified. It has already been mentioned that AI will likely empower disinformation actors at a much higher pace than it will empower those who want to counter disinformation. This introduces one of the biggest challenges mentioned by participants: the challenge of **keeping up with the changing disinformation strategies**. One participant (P12/0:08:06) stated: “I think the problem is that it is probably going to bring more challenges than it brings opportunities. So, it is a net loss for us on the counter disinformation side. It’s cheap to create and distribute disinformation, but it is expensive to debunk.”

This participant (P12/0:08:08) adds: “A lot of what we do at (...), is countering these bot and troll networks. The idea is that they will just scatterbomb disinformation stories left right centre, they don’t have to make any logical sense, they don’t have to be consistent in their arguments, it is just the case of throwing everything at it and seeing what sticks. And I think that that will be a huge problem going forward, because ChatGPT does make things more efficient. A disinformation actor is not going to care whether ChatGPT comes back with a little bit of misinformation in the middle of their answer, because the whole thing is disinformation. So they are going to be able to use that in a way that they want to use it far more effectively than us on the counter disinformation side who are going to have to fact-check AI before we can actually use the responses.”

Another challenge mentioned by participants, is the challenge of **convincing politicians to not tear up the playing field by sharing false information** that suits their narrative. One participant (P7/0:18:38) stated: “The other thing we worked on are the mainstream actors. What we found increasingly is that, when we wanted to track geopolitical activity, it came from Republican and Democratic headquarters. We saw the same thing in the Ukrainian elections. When local actors are also using the same playbook, it’s difficult to see where these foreign actors come in. So how do you convince mainstream politicians who are so obsessed with winning, to not tear up the playing field that they are playing on. I think that politicians like Boris Johnson in the UK have done far more damage to legitimacy than foreign actors have, because they have been so willing to borrow from that autocratic playbook, Trump is the same. So one of the things we did in the 2019 European elections, we launched this, with Joe Biden, just before he announced he was running, this pledge for election integrity, where we invited candidates to sign this pledge in which they stated that they wouldn’t engage in sharing disinformation or deliberately sharing disinformation.”

Also mentioned is the challenge of **convincing policymakers about the urgency** and importance of measures and legislation. One participant (P12/0:18:32) stated: “It’s about not turning a blind eye to these things and being open to see how they can implement into your workflow. It’s about recognizing the problem, as regulators from older generations often cannot see.” Another participant (P16/0:20:18) “More research is needed to determine how disinformation influences different aspects of life and

what the impact of disinformation is. For policymakers, sometimes it is very difficult to say what the specific impact is and provide money to that extent.”

Another aspect is to **have policymakers be up to date with the current developments** in the disinformation landscape. One participant (P13/0:18:38) said: “We ask the elected politicians to make these decisions, but the problem is that they are not always well ahead of the technological curve, they are regulating for the last crisis and not for the next one.” Various participants reflected on the state of regulations within the United States and the European Union, expressing that regulation in the United States is behind on regulation within the EU. One participant (P11/0:05:24) ‘If you look at the speed of legislation, the US is terrible. The European Union is much better than the US in this regard, although it’s still not as fast as we would need.” Another respondent (P2/0:15:08) commented “I think in the US we have a very reactive approach, to these types of things and that largely is because we have this whole beautiful first amendment. Which makes it very limited for us to effectively respond to disinformation.”

Participants mentioned **systematic regulation** as another big challenge. One participant (P16/0:20:18) stated: “Far right says civil society that tries to combat disinformation is just trying to limit free speech, so it is important to be clear what we mean by disinformation. When do we refer to content, when do we refer to manipulation tactics. Especially the content part is quite difficult, because to really say what is true and what is false is quite a difficult concept, and this is also difficult to apply in regulations. I think we should rather go into a system based approach where we specifically look into manipulation, and less into specific pieces of content”.

This participant (P16/0:20:26) adds: “It’s important to not let ourselves be pushed by them on specific topics, like try to answer to that, but rather set our narratives at an early stage, specifically narratives that would promote human rights, show positive examples of inclusion, fighting climate change. This should adapt to the digital space, using modern forms of communication. Not giving other actors so much opportunity to dominate the digital debating space. Does not only depend on the government, but also on public broadcasters, civil society and organizations that do work on climate change.”

Another aspect that was mentioned, is that of **governing influencers with a reach** and the lack of regulations for influencers. One participant (P16/0:20:20) stated: “There are not many rules for influencers with a broad reach.” Disinformation can be hard to identify when it spreads through influencers. Another participant (P5/0:04:09) said “And let’s say, it happens a lot with ads, because people are friends and use collaborations because most of the time it fits with your content, and they need to make money, and this type of strategic authenticity is what’s needed to spread disinformation, and it’s effective because they set it in a language that the community knows and it’s more receptive to it. It’s not like seeing something from a political advertiser, on a poster or something, because you know exactly what it is because you have a certain distance to it, you notice that it is a political

message. But from an influencer, when he talks to you, in his own authentic voice, then this is very effective.”

Summary of the main findings

The interviews show that increased scepticism, more convergence and the operating on a different set of facts are among the most prominent developments. With the influence of artificial intelligence and the fact that this technology is becoming more available to the broad public, it becomes increasingly difficult for those who want to counter disinformation to keep up with false or misleading information. Participants predict that AI will empower disinformation actors at a much higher pace than AI will empower those who fight disinformation. What is needed, according to participants, is a combination of short-term debunking and long-term education. Regulations should also be put in place to slow down the spread of disinformation.

The actors involved in the disinformation landscape consist of private and state actors. Private actors include extremists, crime rings, citizen journalists, and PR firms. State actors mentioned are China, Russia, Iran the West and elites/politicians. However, the availability of technology to create disinformation means anybody could be behind it.

5. Discussion and conclusion

Developments within the disinformation landscape

Increased scepticism toward the government and media institutions after the COVID-19 pandemic has increased disinformation campaigns. Because of this distrust, people get more of their news from social media. This works as an amplifier, as social media platforms facilitate the fast spread of disinformation, give false information higher levels of exposure (Petersen et al., 2019), and often lack effective policies to counter disinformation (Silverman et al., 2022). This leaves society more vulnerable than ever before.

It has been argued that the most effective method to counter disinformation is to depend on the critical thinking of individuals (Roozenbeek et al., 2022). This idea has been supported by this study, as disinformation professionals have deemed media literacy and inoculation as the most effective strategies to counter disinformation in the long term. However, media literacy depends on the willingness of an individual to discover the truth. Increased scepticism and higher levels of disinformation might result in a society that puts less value on truth, and rather picks the information that is most convenient. A society that assumes that governments bend the truth to their needs could at some point stop searching truth itself. Therefore, it is worth exploring further to what extent media literacy has an effect when individuals are not looking for truthful information.

Twisting the facts for own benefit is often a strategy associated with far-right actors (Yoon, 2023). However, as stated by one of the participants during an interview, this disinformation during the 2016 US presidential election came from both Republican and Democratic headquarters. It could be argued that, as disinformation becomes more accessible and widely used as a tool, individuals from all ideologies could increasingly start using it.

To make this point clear, it could be said that we are moving toward a society that increasingly weaponizes information, using it to reach individual goals, instead of using it to discover the truth of any given topic. A society that does not trust the intentions of governments, institutions, media, and science, might use disinformation as a tool to reach these goals, whether it believes this information or not. This will not limit itself to far-right actors, as it could be used by anyone that has an agenda. We are moving toward a society where everything can be called into question and people will increasingly operate on the basis of a different set of facts. Operating on a different set of facts will likely increase the difficulty of democratic decision-making and increase polarization: if society cannot decide what is fact and what is not, it becomes very difficult to argue differences.

When a society stops operating on a shared set of basic facts, this can result in the ability of malicious actors to create doubt around allegations. Any public figure could easily deny allegations, by simply stating that the evidence is fake. Proving whether the evidence is fake or not will then become a major

challenge, as misinformative content becomes more prominent within society, creating a constant “paralyzing fog of doubt”, as described by Begley et al. (2007). The notion “innocent until proven guilty” will then acquire a whole new meaning, as claiming innocence will likely become much easier than proving guilt.

The influence of AI on the disinformation landscape

This issue grows as disinformation becomes more realistic due to the influence of technology, and AI in particular. It will be harder to prove guilt, the more believable disinformation becomes. In addition to this, AI will likely empower disinformation actors at a much higher pace than it will empower those who want to counter it, leading to the inability to keep up with new developments or strategies used by disinformation actors. Where disinformation actors mainly focus on the creation of confusion or doubt to achieve their goal, those who want to counter disinformation need to fact-check and debunk before they can verify information as true or false. Verifying information will take much more time, effort, money, and other resources than creating and distributing false information. If verifying false information is accomplished, this rectification often does not reach near the same number of people, as has also been stated by Roozenbeek et al. (2022).

Social media users find it increasingly difficult to distinguish false information (Au et al., 2021; Borges & Gambarato, 2019). This becomes even more difficult with the rise of AI-generated disinformation. In addition, it is predicted that the more tools we acquire to counter disinformation, the more disinformation actors have access to tools that can refine their disinformation strategies. Therefore, the consensus is that disinformation actors are taking a step ahead and debunking disinformation will become a bigger challenge as AI progresses.

The development of personalized disinformation and avatars will increase in the coming years. This is in line with findings of Kertysova (2018). Personalized disinformation will create a stronger emotional resonance, especially when it comes through avatars or a chatbot that appears more human. AI-generated disinformation that might previously have not been as convincing, will have a higher likelihood of convincing someone when it spreads through a personified avatar or chatbot.

Strategies to counter disinformation

A prominent strategy mentioned among the participants, is media literacy or inoculation. This is in line with the findings of Cook et al. (2017), who found that inoculation is an effective method for “neutralizing” the effects of misinformation about climate change. Participants mentioned that media literacy should aim to educate future generations, to teach them how to analyse information and assess what sources are credible and which are not. Participants have also stated that it is very difficult to change the mind of an individual who has gone down “the rabbit hole” of believing in conspiracies. In the literature, this has been described as the “backfire effect”, whereby individuals will solidify their original opinion after being exposed to correcting information (Cook et al., 2015; Garrett & Weeks,

2013; Nyhan & Reifler, 2010). According to some, this means that those who are not open to new views and fall victim to cognitive bias, are lost. Therefore, media literacy should be provided from an early age.

In addition, debunking is a strategy that can be utilized. However, as mentioned by participants, debunking of disinformation comes with various disadvantages, such as high costs, slow response time, and low reach. This is in line with the literature, which has argued that correcting disinformation after it is spread comes with various other challenges, such as the challenge that fact checks are unlikely to reach each individual exposed to misinformation, getting individuals to believe checked facts is difficult, effective interventions are difficult to scale to a population level, testing the effectiveness of interventions outside of the laboratory setting can be challenging, and correcting misinformation does not always nullify the effect, a phenomenon known as the *continued influence effect* (Roozenbeek et al., 2022).

For debunking to remain effective, AI and other technologies used by disinformation actors should be leveraged. AI can be used to improve processes, make debunking more efficient, and make it faster. As stated by Nucci et al. (2021), technology can “help improve the transparency around fake claims and misinformation”. This can then be combined with education. According to Nucci et al. (2021), the issue not only lies in detecting fake news, but also in a lack of trust and critical thinking. Organizations that debunk should focus on researching new technologies such as image generation, to understand how they function and help educate people in the long term. As stated in the literature, scalability is an important tool because the quantity of misinformation online makes it almost impossible to inoculate people to every individual piece of misinformation (Roozenbeek & van der Linden, 2018).

Putting regulations in place is another aspect. It has been argued that social media is a major facilitator in the fast spread of disinformation and gives disinformation high levels of exposure (Timmer, 2017). As citizens are getting more of their news from social media, social media companies have a major role to play in countering disinformation. Because changing their algorithms is not in the commercial interest of these social media companies, regulations should be put into place to achieve this.

The main challenges and recommendations for future research

The first major challenge that is mentioned by participants, is keeping up with the (AI-)strategies used by disinformation actors. As stated, it is very likely that disinformation actors will stay ahead of those who want to leverage the same strategies to debunk disinformation. Researchers and organizations that counter disinformation should work on ways to make debunking cheaper, more efficient, and less time-consuming. Efforts should be made to move from a reactive approach to a more proactive approach, by leveraging AI to predict and recognize future disinformation strategies.

The second challenge is that of convincing politicians to not tear up the playing field by sharing false information that serves their purpose. If politicians who are obsessed with winning are willing to share false information, they will only contribute to the problem. As we move toward a society that increasingly weaponizes information and operates from a different set of facts, it becomes increasingly important that those in power provide the right example. More research should go into how politicians, public figures and other influencers can be held accountable for the information they spread.

A third challenge is convincing policymakers about the urgency of the topic of disinformation. If the goal is to implement media literacy in schools, then policymakers need to be convinced of the urgency of the matter. This will also mean that they need to be updated on the newest developments within the disinformation field. Policymakers often do not recognize the dangers of disinformation, nor are they up to date with the most recent developments. Future research should focus on the concrete effects of disinformation within different contexts, as facts and numbers are necessary to convince policymakers.

When the goal is to provide media literacy and implement education on disinformation on a societal level, more research will be needed on the effectiveness of inoculation methods and how to implement these. In addition, research should continuously focus on updating the education on disinformation. However, for this to be effective, more consensus on the importance of media literacy should be reached. This brings us back to the previous point, as policymakers will play a crucial role in the implementation of media literacy in the education system.

Regulation is often mentioned as a measure to counter disinformation. However, with the current polarization in the world, developing meaningful regulations will remain a major challenge. In the United States, regulations to decrease the spreading of disinformation are often seen as a limitation of free speech. The European Commission (2018) released a report, arguing that regulations are “a blunt and risky instrument”.

Regulators in the US are unable to enforce meaningful regulations, because they fear being seen as censors. To tackle this problem, participants have proposed a strategy-based approach instead of a content-based approach. This means that regulation should not be focused on telling anyone what is true and what is false, but should instead be based on the identification of manipulative tactics in disinformation. For regulation, this could mean that they could focus on minimizing manipulative content, instead of just aiming to minimize certain information itself. More research is needed to determine how disinformation can be defined and regulated, and where the line should be drawn between fact and opinion.

Limitations

Some limitations should be discussed for this study. For practical reasons, participants were contacted through LinkedIn. Because of random selection, participants had different focus areas and characteristics. In this study, a few comparisons have been made between regulations within the United States and Europe. However, these statements should be treated with care, and it is recommended to analyse these comparisons further. In addition, a limitation regarding the interviews should be mentioned. The interviews were conducted in English, instead of the native languages of all participants. This could sometimes limit their ability to express themselves or give nuanced opinions. Finally, it is possible that some participants were connected on LinkedIn. Having read each other's posts on disinformation before, they might have established a similar vision or have reflected on the same information when giving their opinion.

Conclusions

This study seeks to contribute to existing research, by providing an updated reflection on the developments of disinformation, under the influence of new AI-technologies. This study also offers a reflection on the strategies expected to remain most effective as the disinformation landscape develops.

Regarding the changing landscape of disinformation, the influence of artificial intelligence and the strategies predicted to be most effective, the following conclusions can be drawn. First, society is becoming increasingly sceptical of experts and science, in a way that has not been seen before. In addition, false narratives are increasingly converging between domains. The landscape is shifting toward a society that increasingly operates on the basis of different facts and opinions. This also means that it will become increasingly more difficult to hold disinformation actors accountable, because they can easily deny allegations.

Regarding the influence of artificial intelligence, a big topic is AI-generated disinformation. Generative AI is moving toward enhanced video-based and audio-based disinformation. It is predicted that the influence of artificial intelligence will mean that researchers, the media, and the public will not be able to keep up with new issues. It is also commonly stated that disinformation will likely empower disinformation actors at a much higher pace than it will empower those who want to counter it. Where disinformation actors mainly need to cause confusion to reach their goal, those that aim to counter it need time, money, and other resources to debunk the information.

Even if they succeed, it is unlikely that the corrected information reaches nearly the same number of individuals as the disinformation did. The development of personalized disinformation and avatars creates an additional challenge. Avatars and chatbots that appear human create emotional resonance. This allows individuals to feel as if they are talking to a person, which increases the likelihood that

they will accept the disinformation and truth. Future developments of the web, such as a decentralized Web 3.0 or the Metaverse, will increase the difficulty of holding disinformation actors accountable.

The first strategy identified as effective is media literacy/inoculation. Educating the public on how to critically analyse information, assess what is a reliable source, and which strategies are used to persuade could be effective in the long term. For this to be effective, education on disinformation should be a societal effort, implemented in schools, and taught from a young age.

However, there is no single strategy that works and solves everything. Media literacy should be combined with debunking. Because media literacy is a strategy that works mainly in the long term, there will always be room for debunking of false information. As mentioned before, debunking comes with various challenges. For this, artificial intelligence that is used to create disinformation should be leveraged to debunk it. It can be used to gain a better understanding of what AI-generated disinformation will bring moving forward. It can also be used to make debunking more efficient and faster overall. In addition, regulations for social media platforms are a risky but effective measure to minimize the spread of disinformation.

The main actors mentioned are divided into private actors and state actors. Private actors might consist of extremists, crime rings, citizen journalists, and PR firms that make a profit from creating and distributing disinformation. State actors mentioned are China, Russia, Iran, the West, and elites/politicians. However, the availability of technology to create disinformation means anybody could be behind it.

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Appendix A: Interview questions

About the interviewee (5 minutes)

1. What research have you done on disinformation?
2. How many years of experience do you have in disinformation research?
3. What is your area of expertise?

The changing landscape of disinformation (15 minutes)

*E.g. changing actors (scientists, governments, political organizations, industry, media, public).

*Categories of climate change denial (trend denial, denial of attribution, denial of consensus etc.).

4. How will the landscape of disinformation change in the coming years?
 - What are the trends?
 - What are the challenges?
 - Which changes will take place?
 - Which actors are involved?
 - How does this influence disinformation?
 - Anything to add?

AI influence (15 minutes)

*Influence of AI-generated disinformation (deepfakes).

5. What are upcoming trends in disinformation?
 - How will this influence disinformation?
 - What challenges do they bring?
 - How will they change the disinformation landscape?
 - Which actors are involved?
 - How do these influence disinformation?
 - Anything to add?

Strategies (15 minutes)

*E.g. debunking disinformation after it is received, prebunking (inoculating) the public, using AI to identify disinformation online, imposing regulations, fact checkers.

6. Which strategies to combat disinformation work best according to you?
 - What are the challenges?
 - Changes?
 - Actors?
 - Which changes will take place?
 - Which actors are involved?
 - How does this influence disinformation?
 - Anything to add?

Appendix B: Codebook

Themes	Codes	Code description
The changing landscape of disinformation (trends)	Increasing scepticism	Participant refers to an increase in scepticism toward the government, institutions or the media.
	Convergence	Participant refers to a parallel of disinformation narratives between domains, such as climate change, the COVID-19 pandemic or the war in Ukraine.
	A society that operates on a different set of facts	Participant refers to a society that increasingly operates on a set of different facts, or gets news from more different outlets.
The influence of artificial intelligence	AI-generated disinformation	Participant refers to AI-generated disinformation, including video- and audio based content.
	Increased empowerment of disinformation actors	Participant refers to how developments will empower disinformation actors more than those that want to counter disinformation.
	Personalized disinformation	Participant refers to personalization of disinformation, including targeted disinformation and avatars.
The most effective strategies to counter disinformation	Media literacy, prebunking and inoculation	Participant mentions media literacy, prebunking, education, inoculation or other preventive strategies.
	Debunking	Participant mentions debunking or leveraging AI to debunk.
	Leveraging AI to counter	Participant mentions using and developing AI to either predict disinformation strategies or counter them.
	Regulations	Participant refers to imposing regulations, or other measures related to holding actors accountable, such as deplatforming or blocking.
Challenges	Keeping up with changing strategies	Participant refers to the inability to stay ahead or keep up with disinformation strategies.
	Convincing politicians to not tear up the playing field	Participant mentions the challenge of convincing politicians to not contribute to the chaos by sharing misleading information that favours them.
	Convincing policymakers about the urgency	Participant mentions convincing policymakers about the urgency of taking measures against disinformation.
	Have policymakers up to date with developments	Participant refers to the challenge of keeping those that need to make decisions updated on the current

Actors	Private actors	Participant refers to extremists, crime rings, citizen journalists and PR firms.
	State actors	Participant refers to countries or public- and company officials, such as China, Russia, Iran, the West, elites and politicians.
