

Sandra Walzenbach; Thomas Hinz

**Working Paper**

## When Confirmation Bias Outweighs Expertise: A Factorial Survey On Credibility Judgments Of Polarizing Covid-19 News

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# When Confirmation Bias Outweighs Expertise: A Factorial Survey On Credibility Judgments Of Polarizing Covid-19 News

Sandra Walzenbach

University of Konstanz (DE), <https://orcid.org/0000-0001-5240-2157>

Thomas Hinz

University of Konstanz (DE), <https://orcid.org/0000-0002-8940-3003>

## Abstract

In today's digital media landscape, individuals must judge the credibility of competing information from an unprecedented range of sources, including established news organizations, political actors, unverified online voices and self-declared experts. Building on a theoretical discussion of how the internet and social media – with its algorithmic curation, its omnipresent misinformation and strategic disinformation – have altered media consumption, this study examines the challenges individuals face in evaluating the credibility of media content. Informed by dual-process theory and the concept of motivated reasoning, we explore the roles of both belief-consistency and established quality cues (namely source expertise and data references) in shaping credibility judgments.

We use the Covid-19 pandemic in Germany as a case study of polarization, contrasting an inconspicuous majority with a vocal minority represented by the “Querdenker” protest movement. Heavily relying on social media, this movement mobilized a heterogeneous base of supporters united by deep-rooted mistrust of politics, science, and mainstream media. To investigate these dynamics, we conducted a factorial survey experiment in which a general population sample evaluated the credibility of Covid-19–related media content. The results provide strong evidence of confirmation bias, no detectable effect of quality cues, and remarkably similar evaluation strategies across both groups.

**Keywords:** public opinion, media perception, polarization, Covid-19, confirmation bias, factorial survey experiment

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## 1) INTRODUCTION

In today's digital era, social media platforms have become a prominent tool for disseminating information and shaping public opinion. Particularly among the younger generation, social media platforms have even become popular sources for news consumption (Geers 2020; Leppert and Matsa 2024; Medienpädagogischer Forschungsverbund Südwest 2024; PricewaterhouseCoopers 2018). However, with the rise of misinformation on the internet, concerns have emerged regarding its influence on public opinion formation. The fear is that particularly social media promote political polarization, undermine the sense of social cohesion and ultimately pose a threat to fair elections and democracy (Panizio 2023).

Social media have been widely criticized for facilitating the dissemination of misinformation and for creating echo chambers, in which individuals are predominantly exposed to information and opinions that align with and reinforce their pre-existing beliefs (Bail 2021; Pariser 2011; Sunstein 2018). In addition, political actors and opinion makers make use of a toolkit of computational methods to shape public opinion – methods that go far beyond platform algorithms designed to generate clicks and user engagement. These include search engine optimization (Bradshaw 2019), the use of bots, trolls, and micro-targeted ads to manipulate narratives, marginalize dissenting opinions, and influence voter behavior with political social media campaigns. A recent study analyzes online manipulation campaigns by political actors (and the private companies they often work with) across 81 countries (Bradshaw, Bailey, and Howard n.d.), highlighting both the global scale of the problem and the contradictory media environment in which internet users now find themselves.

Against this backdrop, we first discuss the challenges internet users face nowadays when consuming news online. In a second step, the empirical part of the study focuses on the recipients' side of misinformation and contributes to a better understanding of the mechanisms of media perception that have contributed to polarization in the face of the Covid-19 pandemic - an exceptional situation, in which it was particularly difficult for individuals to distinguish between facts and fake news, as both types of contents vividly circulated (and continue to circulate) online.

Relying on previous research in cognitive psychology, we designed a factorial survey experiment, in which participants evaluated the credibility of media contents. Our study was designed to measure the extent to which conventional quality cues of the media contents (namely source expertise and data references) determine their perceived credibility, and to what extent such evaluations are shaped by *confirmation bias*, the tendency to favor evidence for what we already believe (Taber and Lodge 2006). In the context of media perception, confirmation bias – reinforced by online dynamics – can strengthen pre-existing beliefs, thereby hindering the acceptance of factual and high-quality information. Understanding the role of confirmation bias in shaping credibility judgments is crucial for understanding information processing and decision-making in the digital age.

In doing so, our study extends beyond the exiting literature by analyzing the relative influence of quality cues and confirmation bias on belief formation within a context that is typical to the altered reality of online news consumption. To this end, we move beyond prior research that typically operationalizes ideological orientation as a dichotomous variable (e.g. conservatives vs liberals). Instead, we use a factorial survey experiment that presents diverse respondents

with news content spanning multiple ideological shades, thereby capturing a broader spectrum of political attitudes. This strategy allows us to simultaneously estimate the effects of both quality cues and confirmation bias. In addition, we incorporate paradata in the form of latency times to gain deeper insights into the mechanisms of confirmation bias, allowing us to assess if respondents predominantly avoid or actively dispute counter-attitudinal content. Our methodological approach combines the internal validity of an experimental design with the external validity of a nationwide survey, allowing us to draw meaningful conclusions concerning the psychological underpinnings of political polarization with its practical implications for communication strategies aimed at countering misinformation.

## **2) THEORETICAL BACKGROUND AND PREVIOUS RESEARCH**

### **2.1) Polarization during the Covid-19 pandemic in Germany (and beyond)**

During the Covid-19 pandemic, Germany witnessed an ideological divide, giving rise to a protest movement that heavily mobilized over social media platforms. While an inconspicuous majority generally approved of the political response to the pandemic and complied with governmental restrictions to limit the spread of the virus, the much louder minority opposed to such measures attracted a lot of media attention. The *Querdenker* (literally: „lateral thinkers“) protest movement mobilized thousands of citizens for demonstrations all over Germany (Grande et al. 2021). Its political arm *Die Basis* (literally: „the base“), founded in July 2021 as a protest party, gained 1.4% of all votes in the general election in September 2021. The protest movement had a very heterogeneous base of supporters including esoterics, leftist Covid-deniers, conspiracy believers, and right-wing extremists (Frei and Nachtwey 2021; Koos and Binder 2021; Nachtwey, Schäfer, and Frei 2020). However, these groups found common ground in their belief that face masks, vaccinations and Covid tests constitute an unjustified violation of their personal freedom. In addition, they share a deep-rooted skepticism and mistrust toward politics, science and the mainstream media. As a consequence, discussions between the majority group of society and supporters of the protest movement often fail already in the attempt to agree on the facts. Studies suggest a correlation between pandemic denial and the consumption of social or “alternative” media (Faas et al. 2022; Rothmund et al. 2022). Although experimental evidence on a causal relationship is scarce, it is noteworthy that the protest movement was accompanied by intensive activity on Telegram, where highly emotional and controversial messages were disseminated (Almodt 2023; Ebtsch et al. 2020; Holzer 2021; Schulze et al. 2022).

This case illustrates how political polarization is associated with social media, and although our study focuses on media perception during the Covid-19 pandemic in Germany, the relevance of the phenomenon extends well beyond the German context. Polarization between partisans has shown an upward trend in the US over the past decades (Iyengar, Sood, and Lelkes 2012) and has presumably reached a new peak with the latest political events. The Brexit referendum in the UK is another example to demonstrate that other countries suffer

from even deeper ideological divides than Germany. However, these examples have a common feature: heated political campaigns on social media that are very much characterized by the co-existence of misinformation, deliberate disinformation and facts.

## **2.2) Social media: echo chambers, organized manipulation and polarization?**

Social media have been one of the prime suspects in the attempt to explain polarization, and its influence on public opinion has been controversially discussed in the scientific literature (Bakshy, Messing, and Adamic 2015; Barberá et al. 2015; Ebner 2019; Flaxman, Goel, and Rao 2016; Guess et al. 2018; Sunstein 2018; Terren and Borge-Bravo 2021; Zuiderveen Borgesius et al. 2016). Put positively, the internet provides a space for free speech, allowing nearly everyone to express themselves with minimal censorship. On the downside, this also means that misinformation can spread easily across the web, at a fast pace and effortlessly bridging geographical distances. Research has even shown that fake news spread faster than facts (Brady et al. 2017; Vosoughi, Roy, and Aral 2018). During the COVID-19 pandemic, misinformation could flourish (Batzdorfer et al. 2022; Cinelli et al. 2020; Naeem, Bhatti, and Khan 2021), with few control mechanisms in place, while fact checking sites appeared to be fighting against windmills (Burel, Farrell, and Alani 2021).

Besides the accelerated spread of misinformation that social media make possible, a second mechanism that potentially contributes to polarization has to do with the algorithms that determine what users see online. This is algorithmic curation is what Zuiderveen Borgesius et al. 2016 call *pre-selected personalization*. Based on search history and past consumer behavior, internet users receive tailored contents, e.g. from search engines (Epstein and Robertson 2015; Steiner et al. 2020) and social media platforms (Bakshy et al. 2015; Levy 2021). Together with user preferences ("*self-selected personalization*"), *pre-selected personalization* is discussed vividly in the scientific community. The underlying worry is that ideological divides will grow if people only see what they already believe in (Pariser 2011; Sunstein 2018), a phenomenon that is often referred to as causing *filter bubbles* or *echo chambers* as an umbrella term to cover both mechanisms of personalization.

Research has shown that provocative populist narratives are especially appealing to users (Brady, Crockett, and Van Bavel 2020; Yanchenko 2022), and that emotional messages spread more quickly through the web than factual information. Social media platforms are known to reflect and reinforce this user behavior through algorithms that prioritize controversial content in order to maximize user engagement and increase the time users spend on the platform. Facebook, in particular, has been criticized for actively promoting conflict, polarization, and escalation worldwide (Milmo 2021). It was also involved in scandals surrounding targeted political campaigns during the U.S. presidential election (Eady et al. 2023; Guess, Nyhan, and Reifler 2020; Parkinson 2016; Read 2016), as well as Cambridge Analytica's support for the "Leave EU" campaign (Rehman 2019; The Guardian 2018). These cases exemplify a broader trend in which political actors collaborate with PR firms or civil society groups to conduct what (Bradshaw et al. n.d.) describe as "organized social media manipulation". These campaigns can make use of human-curated ("trolls") and AI-generated

accounts (“social bots”) who amplify specific narratives, drive traffic and distort public opinion on social media (Azzimonti and Fernandes 2023; Bradshaw et al. n.d.).

Criticism of social media platforms typically focuses on their insufficient efforts to curb the spread of such content. Empirically, however, it remains unclear if internet and social media use causally drive political polarization. Although current research tends to find modest effects of filter bubbles and echo chambers (Flaxman et al. 2016; Guess et al. 2018; Van Bavel et al. 2021; Zuiderveen Borgesius et al. 2016), results heavily depend on study design, available data sources (self-reports or digital trace data) and operationalizations of polarization (for an overview, see Terren and Borge-Bravo 2021). Comparatively many studies report correlations between internet or social media use and political attitudes (Boxell, Gentzkow, and Shapiro 2017; Faas et al. 2022; Groshek and Koc-Michalska 2017; Rothmund et al. 2022), describe social media networks (e.g. Conover et al. 2011) or analyze social media contents (e.g. Boberg et al. 2020). But there are few studies with experimental approaches that examine a potential causal relationship between online news exposure and polarization (for exceptions, see Allcott et al. 2020; Asimovic et al. 2021; Bail et al. 2018; Levy 2021 who e.g. experiment with abstinence from Facebook).

### **2.3) Challenges of online news consumption: the truth in crisis**

We have discussed how the internet makes it easy for misinformation to spread on a large scale and irrespective of geographical distance. Algorithmic personalization and targeted manipulation create an environment, in which familiarity might be mistaken for truth. Nonetheless, the internet has become a resource for news consumption: Particularly adolescents and young adults use platforms such as Facebook, Instagram, Youtube and TikTok to keep themselves informed about current world events (Geers 2020; Leppert and Matsa 2024; Medienpädagogischer Forschungsverbund Südwest 2024; PricewaterhouseCoopers 2018). It is unclear to what extent they are aware that the responsibility of verifying information authenticity has shifted from institutional gatekeepers to the individual user.

In contrast to traditional media outlets for news consumption (such as television, radio and newspapers), internet-based news consumption allows a broader range of individuals to act as senders of political information. These individuals may advocate opinions that would not be considered well-founded or legitimate within traditional media environments. On social media, however, both true and false information become easily accessible. Misinformation and populist opinion pieces coexist seamlessly alongside preprints and peer-reviewed scientific studies, placing individual users in the challenging position of having to judge their authenticity. This blurring of sources makes it difficult for laypeople - and even for journalists - to distinguish what is true and what is not (King 2020; Stollorz 2021).

In addition, it is important to consider that the internet has fundamentally changed the way users consume news and interact with political information. The logic of social media encourages quick reading of fragmented information without much context as well as fast-paced engagement, reinforcing a broader trend toward superficial and rapid news consumption. Platforms such as TikTok, increasingly used by younger audiences for news,

blend entertainment and emotional engagement with information - often referred to as "infotainment" - further blurring the line between factual reporting and opinion-based content (Wang et al. 2025).

### **3) JUDGING NEWS CONTENTS IN AN ONLINE ENVIRONMENT**

#### **3.1) Dual-Process-Theory: judging authenticity under time pressure**

As the pace of information accelerates, it becomes increasingly unlikely that users engage in systematic processing or make effortful decisions when evaluating the credibility of political information. According to the Elaboration Likelihood Model (Petty and Cacioppo 1986), how systematically recipients process depends on their ability (e.g. digital literacy, previous knowledge) and motivation (e.g. the personal relevance of the topic, their need for cognition, time pressure). When elaboration likelihood is high, the receiver of a news content will thoroughly evaluate the arguments' quality together with peripheral cues (such as the layout, emotional appeal of the message, source attractiveness). Under low elaboration likelihood, users will more strongly rely on such peripheral cues rather than rational ("central") processing of factual content (Petty and Cacioppo 1986: 671). Similarly, (Kahneman 2011) argues that in fast, heuristic thinking, people are more prone to cognitive shortcuts and biases, making them less responsive to factual corrections or complex arguments. Under these conditions, facts tend to matter less than emotionally resonant or easily digestible content. It is important to note that systematic processing does not necessarily protect individuals from believing misinformation (Pantazi, Hale, and Klein 2021: 285 seq). There is evidence that it can do both, help individuals to identify fake news (Erlich et al. 2023; Pennycook and Rand 2019) as well as make them engage in identity-protective motivated reasoning (Kahan et al. 2017), which will be discussed in detail in the next paragraph.

An important peripheral cue in news consumption and credibility assessments is source expertise. Within the framework of the Elaboration Likelihood Model, source expertise can be processed superficially, serving as a heuristic cue or cognitive shortcut, or it can be evaluated systematically as part of a more deliberate judgment process. Moreover, peripheral cues may trigger a more systematic examination of all available information (Petty and Cacioppo 1986: 188). In line with this notion, prior research indicates that ambiguous or conflicting cues - such as discrepancies between message content and source credibility - can induce more systematic cognitive processing. Empirically, such deeper processing has been observed in longer response latencies during evaluation tasks, lower perceived credibility ratings for expert sources presenting flawed arguments (compared to non-expert sources), and greater differentiation between strong and weak arguments (Guarana and Hernandez 2016; Heesacker, Petty and Cacioppo 1983; Wertgen and Richter 2020).

#### **3.2) Source characteristics**

To manipulate source expertise, experimental studies have implemented various approaches. For instance, Tilburt et al. (2011) utilized articles from either a highly reputable or a low-

quality scientific journal, Bauer and Clemm von Hohenberg (2021) contrasted a renowned news outlet with a fabricated source, and Oeldorf-Hirsch and DeVoss (2020) presented news items from the sources that individual respondents reported trusting the most and the least. In a meta-analysis of 114 studies, (Wilson and Sherrell 1993) investigated which factors influence credibility perceptions. Across these studies, manipulations of source characteristics - such as credibility, expertise, trustworthiness, physical attractiveness, and ideological similarity - accounted on average for 4.5 % of the variance in credibility judgments, with expertise (often operationalized as educational attainment or years of professional experience) contributing the largest share.

Other studies have manipulated the quantity of context information provided in media content. Examples include varying whether the authoring institution was mentioned, whether statistical information was included, and whether numerical data were accompanied by visualizations (Gondwe, Rowe, and Some 2021; Henke, Leissner, and Möhring 2020; Tong 2024).

Source characteristics may have served as a more reliable indicator of content quality in the pre-internet era, when information was disseminated by a relatively limited number of established organizations. In the contemporary online environment, however, interpreting such cues has become more challenging, as messages now originate from a vastly larger and more heterogeneous set of individuals and institutions. This shift raises important questions about how users navigate and evaluate information in this new media landscape.

### **3.3) Confirmation bias and opinion formation**

In what follows, we argue that seeking the truth might not be the primary driver of belief in media contents. While the Elaboration Likelihood Model would argue that “people are motivated to hold correct attitudes” (Petty and Cacioppo 1986: p.127), but that “the amount and nature of issue-relevant elaboration in which people are willing or able to engage [...] vary with individual and situational factors” (p.128), research on *motivated reasoning* goes a step further. Taber and Lodge (2006) suggest that, in everyday life, human beings are often not exclusively concerned with finding out the profound truth about an issue when they assess information. Equally important in forming an opinion can be the subconscious motivation to uphold rather than contradict a positive self-image, values, and group affiliations – a strategy to avoid cognitive dissonance (Festinger 1957). This idea is in line with a strand of research that sees conspiracy beliefs as a strategy to fulfil basic psychological needs, such as the need to see structure in the world, to avoid insecurity and to preserve a positive identity (Douglas 2021; Douglas et al. 2019). Similar factors (such as the need for structure and political stability, intolerance of uncertainty, fear of loss) have also been consistently found to correlate with political conservatism, leading to the hypothesis that certain groups might be more susceptibility to motivated reasoning than others (Jost et al. 2003).

Motivated reasoning manifests through cognitive mechanisms that can be subsumed under the broader concept of *confirmation bias*. The term refers to the tendency to selectively seek, interpret, and recall information that aligns with pre-existing beliefs, while discounting or ignoring contradictory evidence (Shermer 2012). Strictly speaking, the term *confirmation bias*



can describe different cognitive mechanisms (Klaczynski and Narasimham 1998; Taber and Lodge 2006). Unfortunately, the exact naming conventions sometimes vary between authors. For this paper, we will understand confirmation bias as an umbrella term that comprises up to three different mechanisms that may contribute to polarization:

- *Self-selection* into belief-consistency: Humans tend to *avoid* exposure to information that contradicts their pre-existing opinion. They prefer to surround themselves with people who think similarly and prefer newspaper articles or channels on social media that confirm their views.
- *Attitude effect*: Information that confirms pre-existing opinions seems more credible to people than information that contradicts their opinion.
- *Disconfirmation bias*: Humans undertake more cognitive effort to *refute* information that contradicts their opinion, so they are more likely to find arguments why this contradictory information is wrong or why the phenomenon described is a rare exception.

Looking specifically at previous research on these individual forms, *avoidance*, the first aspect of confirmation bias, is well documented in the scientific literature. A lot of research has been conducted precisely to investigate exposure to online media contents and the internet's contribution to filter bubbles and echo chambers.

Scientists mostly agree that internet users prefer content that is in line with their already existing beliefs (Garrett 2009; Hart et al. 2009 (meta-analysis); Iyengar and Hahn 2009; Knobloch-Westerwick et al. 2015; Meppelink et al. 2019; for a more critical study see: Eady et al. 2019). This reflects the well-known principle of “social homophily” in the offline world: Network analysts have shown decades ago that we tend to create homogeneous social networks by gathering with people who are similar to us in their socio-economic background but also in their political opinions and beliefs (McPherson, Smith-Lovin, and Cook 2001). In this regard, it is not surprising that humans extend their behavioral habits to the online world. This self-selection into belief-consistency might be reinforced by the logic and operating mechanisms of the internet. These considerations suggest that there might be a mixture of technological and psychological mechanisms that in combination can foster polarization. Turning to the latter two aspects of confirmation bias, the *attitude effect* and *disconfirmation bias*, studies rarely differentiate between the selective acceptance of belief-consistent information and the active refutation of belief-inconsistent information (for exceptions using response latency measures, see Taber, Cann, and Kucsova 2009; Taber and Lodge 2006). Nonetheless, laboratory and survey experiments consistently demonstrate that individuals perceive belief-consistent information as more credible than belief-inconsistent information across a wide range of domains, from religious beliefs (Klaczynski and Narasimham 1998) to climate change (Zhou and Shen 2022).

In the U.S. context in particular, motivated reasoning is frequently cited as the driver of partisan polarization, leading individuals to view messages from rival political parties or outlets as disproportionately biased (Clemm von Hohenberg 2023; Kuru, Pasek, and Traugott 2017; Schaffner and Roche 2016; Swire-Thompson et al. 2020; Washburn and Skitka 2018); for a theoretical discussion, see Flynn, Nyhan, and Reifler 2017).

Notably, confirmation bias is not confined to long-held opinions: even first impressions can exert a disproportionately strong influence on subsequent judgments, persisting despite the introduction of contradictory evidence (Hudachek and Quigley-McBride 2022). In highly polarized contexts, however, attitudes are more likely to have developed over extended periods and to be tied to identity-related perceptions and feelings of belonging, which render them particularly resistant to change.

#### 4) RESEARCH QUESTIONS

Our research aims are to better understand the mechanisms of media perception underlying polarization in an exemplary setting of fast-paced online news consumption around the Covid-19 pandemic. This means that users are likely to judge the credibility of the many contents based on imperfect information with little context provided. To assess the mechanisms behind such decision making, we use an innovative methodological approach to quantify both the impact of quality cues and the interaction between message ideology and previous respondent attitudes simultaneously. This means that we can assess the open question about the relative importance of quality indicators and confirmation bias in a scenario of online news consumption. In addition, we use response latencies to gain further insights into the respective prevalences of different types of confirmation bias. On the one hand, it is suggested that humans tend to avoid attitude-inconsistent information (Frost et al. 2015; Knobloch-Westervick et al. 2015; Lowin 1967), which should result in quick heuristic judgments, while, on the other hand, it has been argued that people engage in more thorough and prolonged processing to find counterarguments when their ideas are threatened (Taber & Lodge 2006; Klaczynski & Narasimham 1998). In short, the discussion boils down to the question if people *avoid* or *dispute* belief-inconsistent contents, which should be reflected in their response times, while the Elaboration Likelihood Model would argue that conflicting cues should prompt more systematic processing.

To sum up, we explore the following aspects:

1) Our first research question refers to the main effects of content quality and content ideology:

- Under which circumstances do people believe in a media content: How does the presentation of quality cues (e.g. source expertise or data references) influence belief formation compared to content ideology (mainstream / middle position / denial)?

2) To test for confirmation bias, we consider the potential heterogeneity of these effects, that is, their dependence on pre-existing respondent ideology:

- Do people tend to evaluate media contents as more credible when they confirm their pre-existing opinion, irrespective of quality cues?
- What can we learn about the relative importance of confirmation bias (the interaction of vignette ideology and pre-existing beliefs) and quality cues (e.g. source expertise or referencing data)?
- Is confirmation bias stronger in the protest movement than in the mainstream society?

3) Response times will be used to shed more light on the exact underlying cognitive mechanisms of confirmation bias and the related depth of processing:

- Are attitude-inconsistent contents processed for shorter (avoidance) or longer (dispute) times, compared to belief-consistent contents?
- Do respondents engage in more systematic processing if the situation is ambivalent, that is, quality cues don't match the message content (e.g. counter-attitudinal message combined with cues for good quality vs cues for bad quality)?

## **5) DATA AND METHODS**

### **5.1) A short introduction to Factorial Survey Experiments**

To empirically assess our research questions, we designed a factorial survey experiment on the credibility of different media contents related to the Covid-19 pandemic. The method goes back to Peter Rossi. While originally used to study normative judgments (Rossi and Andersen 1982), it has meanwhile been applied to a wide range of research topics in the social sciences, including perceptions of fair earnings (Auspurg, Hinz, and Walzenbach 2019) or attitudes toward immigration (Hainmueller, Hangartner, and Yamamoto 2015). In factorial survey experiments, respondents' opinions and attitudes are retrieved by asking participants to evaluate scenarios ("vignettes") in which the values ("levels") of several characteristics ("dimensions") are experimentally varied. An independent but joint experimental variation of the factors allows the researcher to quantify their relative impact on the requested evaluations in linear regression models. The relative importance of the presented dimension as well as interactions between different factors or between factors and respondent characteristics can be assessed. Each respondent typically answers a series of vignettes (deck), which are allocated to respondents in a random order (for more information about the method, see Auspurg and Hinz 2015; Jasso 2006; Rossi and Andersen 1982; Wallander 2009).

In our concrete case, the factorial survey experiment accounts for the fact that judgments about the credibility of a media content typically require simultaneous consideration of several factors. Crucially, we chose this design for three reasons: (1) It allows us to simultaneously vary quality cues and content ideology, meaning that we can assess the relative importance of quality and confirmation bias for belief formation. (2) Compared to typical psychological studies with small, homogeneous samples (Henrich, Heine, & Norenzayan 2010), factorial survey experiments retain the internal validity of randomized designs while extending research to large, diverse survey populations. (3) We can use these gains in statistical power by assessing ideological orientation in more than two opposing categories and model interactions between vignette ideology and respondent ideology.

#### **5.2) Design of experimental stimuli**

We took inspiration from real media contents across the ideological spectrum to create a series of texts that could be the beginning of a newspaper or blog article on a Covid-19-related topic. Our vignettes mirror the three topics that emerged as the focal points of particularly controversial debate during this step: risk perception, masks and vaccines.

Respondents received three vignettes, one on each topic, and were asked to evaluate the credibility of the contents on an 11-point scale.

Each text vignette included a headline and a few lines of text as well as some information on the author. For the author names, we chose first names that could easily take a male and female form in the German language (e.g. Daniel / Daniela) and paired them with three of the most common German surnames (namely Schneider, Müller and Schmidt) to avoid any unwanted associations. More importantly, we gave some additional information on the author's affiliation (blogger / journalist / scientist) as a first cue for source expertise. The second indicator of source quality varies the amount of information provided on the data source (no information / reference to a study / study with concrete numbers). Crucial to our design, each vignette topic (risk perception / masks / vaccines) can come in three different ideological nuances (mainstream / middle / denier): In the *denier* ideology, the risks of the virus are denied, while masks and vaccines are portrayed as pointless or dangerous; in the mainstream ideology, the risks of the virus are emphasized, whereas masks and vaccines are described as very effective; in the middle ideology, moderate risks are attributed to the virus, masks and vaccines are evaluated critically, but overall rather positively.

Figure 1 shows the vignette on risk perception in its ideological variants. Example vignettes for all remaining combinations of topic and ideology are shown in the Appendix A1.

Figure 1: Example Vignettes on Risk Perception of Omicron Variant by Ideology, authored by a female journalist and with reference to a study with numbers  
(translated from German original version; layout as presented in the actual survey)

**Omicron: not worse than an ordinary flu**

*By Simone Schmidt, freelance journalist*

Infections with the omicron variant have mild courses. This is confirmed by a recent study, according to which hospitalizations for Omicron infections are only 5% more frequent than for an ordinary flu. In fact, Omicron is not worse than having the flu, neither concerning the risk of contagion nor in the course of the disease. Most infected people show only mild symptoms or no symptoms at all. Even among old people, the risk of a severe course is very small.

[ideology: denier]

**Omicron: milder than Delta**

*By Simone Schmidt, freelance journalist*

Omicron often has milder courses than its predecessor Delta. This is confirmed by a recent study, according to which hospitalizations for Omicron infections are 90% less frequent than for Delta. Nevertheless, caution is still advised. Omicron is more contagious than Delta, and the risk of a severe course remains, at least for older people.

[ideology: middle]

**Omicron: milder than Delta, but not to be underestimated**

*By Simone Schmidt, freelance journalist*

Omicron tends to have somewhat milder courses than its predecessor Delta. This is confirmed by a recent study, according to which hospitalizations for Omicron infections are 60% less frequent than with Delta. Nevertheless, caution is still advised. Omicron is much more contagious than all previous variants and the risk of a severe or even fatal course increases rapidly with age.

[ideology: mainstream]

How credible do you think this text is?												
	0	1	2	3	4	5	6	7	8	9	10	
<b>not at all credible</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<b>very credible</b>

[response scale (as presented in all experimental conditions)]

The complete vignette set-up is depicted in Table 1. Beside the vignette topic, ideology, and the two quality indicators, we varied author's sex as a control variable.

All in all, this set-up leaves us with a 3x3x2x3x3 design and a full factorial of 162 possible combinations. All of these were used for data collection, without drawing a random sample or d-efficient design, meaning that all main effects and interactions between the vignette dimensions can be correctly estimated. Crucially for our research questions, the set-up allows us to assess the relative importance of the varied vignette dimensions as well as interactions between vignette dimensions and respondent characteristics to examine to what extent certain groups differ in their cognitive strategies to judge credibility.

Table 1: Vignette Set-Up

	Dimensions	Levels	No. of levels
1	Topic	- risk perception related to virus ( <i>risk</i> ) - attitudes toward mandatory masks ( <i>mask</i> ) - usefulness of vaccines ( <i>vax</i> )	3
2	Ideology	- in line with mainstream media ( <i>mainstream</i> ) - middle position ( <i>middle</i> ) - denial of any risk / of benefits of measures ( <i>denier</i> )	3
3	Author's sex	- male - female	2
4	Author's affiliation	- blog author - journalist - scientist ("professor")	3
5	Data Source	- no sources indicated - "recent study" - recent study with concrete numbers cited	3
			Vignette universe: 162

Each respondent evaluated a vignette set of three media contents, one on each topic. Vignette sets were randomly assigned to respondents and the order within each vignette set was also randomized.

### 5.3) Data collection and sample

The factorial survey module was implemented within the 4th wave of the "Covid-19 and Inequality - Survey Program" administered by the Excellence Cluster "The Politics of Inequality" at the University of Konstanz (for more info on the project, see web link 1). Data collection took place in April 2022 and used the Bilendi online access panel to recruit from the adult resident population of Germany, meaning that we are studying a sample with some digital literacy. Quotas ensured that the sample matched the general population (according to the Mikrozensus) in age, sex, education and federal state of residence. The survey administration team carried out routine checks on satisficing and speeding through the questionnaire and dropped cases that did not meet the quality standards before delivering the data.

The following analyses are based on 3526 valid vignette evaluations from 1178 respondents. All analyses were conducted with Stata 17.

## 5.4) Questionnaire and explanatory variables

Beside the factorial survey module, the questionnaire provides rich background information on the individual respondents, including many political attitudes as well as education background and response times for individual survey pages. Most importantly, there are different measures to assess respondents pre-existing opinions on the Covid19-related topics of interest, which is crucial for measuring confirmation bias.

- Opinions on vignette topics

Participants were asked a direct single-item question on each of the vignette topics later in the questionnaire. These covered the general risk perception regarding the virus, opinions on mandatory masks in public indoor spaces and perceived usefulness of vaccines (see Appendix A.2 for full question wording). Each answer was assessed on an ordinal five-point scale, which we recoded into three categories: The midpoint was treated as a *middle position*, while respondents leaning toward one side of the scale were assigned to either *mainstream* or *denier ideology*. Note that these direct opinions are a measure on the vignette level, meaning that ideology might vary across different topics within respondent.

- Ideology indicator

As an alternative operationalization and to reduce categories for some analyses, we generated an ideology indicator at the respondent level. Put more concretely, we used a mix of behavioral and attitudinal items to group respondents into leaning toward *mainstream* versus *protest ideology*. Namely, these items are: participation in protests against Covid19 measures or vaccines, understanding for these protests, preference for a political party associated with the protest movement, complete mistrust in the government and complete mistrust in science (see Appendix A.4-A.6 for full question wording). Table 2 shows these items as well as their prevalence in the sample. Whenever two or more of these items applied, respondents were coded as sympathetic with protest ideology for the dichotomous ideology indicator. This applies to 16.5% of the sample.

In section VI.1, we will argue that this indicator distinguishes respondent ideology in a meaningful way by relating it to other survey responses that we would theoretically suspect to differ between ideology groups.

Table 2: Ideology index identifying ideological proximity to protest movement

	share for which this applies
Participation in protests	3.7%
Understanding for protests	19.3%
Party preference AfD or Basis	8.0%
Complete mistrust in government (0 on 7-point scale)	21.3%
Complete mistrust in science (0 on 7-point scale)	7.0%
<b>“protest ideology” if at least 2 of the former apply</b>	<b>16.5%</b>

- Cognitive dissonance

To construct an indicator for cognitive dissonance, we obtained nine initial groups from crossing vignette ideology (mainstream / middle / denier) and respondent ideology regarding the vignette topic (mainstream / middle / denier). Out of these, all cases in which respondent and vignette ideology matched, were recoded to a middle category indicating no cognitive dissonance. The remaining groups were ordered in a way that distinguishes vignettes being more mainstream than the respondent (left side of the midpoint) and vignettes being more in line with protest ideology than the respondent (right side of the midpoint), with cognitive dissonance becoming bigger toward the outer rims of the distribution. For some analyses we use a condensed version of this indicator that reduces it to three groups (no or little cognitive dissonance / high cognitive dissonance for those leaning toward the protest movement / high cognitive dissonance for those with mainstream or middle position ideology).

- Response times

Response times were calculated on the vignette level. To adjust for individual differences in baseline speed, the respective vignette response time was divided by the time needed to answer an easy module at the beginning of the questionnaire. This module was considered suitable as a measure for baseline speed because it contains 19 factual questions, e.g. on place of residence, civil status, and the number of partners and kids in the household, and does not offer any filter branches to shorten the questionnaire for some but not all respondents.

## 5.5) Analytical Strategy

Considering the 11-point response scale, on which the vignettes were assessed, the main method of analysis will be linear regression models. To account for the multilevel structure of our data (with vignettes being nested within respondents), all models were calculated using cluster-robust standard errors. For better readability, the manuscript contains only graphical representations of the models, while the full tables can be found in Appendix B.

For the first research question (section VI.2), we will regress the vignette evaluations on all varied vignette dimensions. This will give a first overview of the relative effects of vignette topic, quality cues (author affiliation and data references) and vignette ideology on respondents' credibility assessment.

The second research question aims at uncovering confirmation bias. Measuring confirmation bias requires including more information on pre-existing respondent opinions: We need to include interaction terms between vignette ideology and a measure of pre-existing respondent ideology, while controlling for objective quality. This can be done on the vignette level or on the respondent level. We will apply both strategies to draw conclusions as to whether confirmation bias is more pronounced in supporters of the protest movement than in the societal majority. Analysis on the vignette level uses the respective single-item question for each vignette topic and allows for the possibility that respondents might be a *mainstreamer* on one vignette topic but a *denier* on another (section VI.3). In practice, this pattern is rare, which is why we partly refer to easier-to-read analysis on the respondent level, which makes use of the ideology indicator (section VI.4). As discussed above, this indicator is based on the



additional person-level behavioral and attitudinal information in the questionnaire. Note that our results and conclusions are robust across both operationalizations of respondent ideology. To shed more light on underlying cognitive strategies to judge the credibility of media contents (as addressed in our third research question), we analyze latency times as a function of experienced dissonance levels and quality cues in quantile regressions, estimating response times for the 20%, 50% and 80% percentile with the stata command `qreg2` (Parente and Santos Silva 2016) in section VI.5. This method is ideal for our purposes, and much better suited than e.g. a standard regression approach, which would only compare means across different cognitive dissonance groups. Theoretically, we argued that two competing cognitive mechanisms, avoiding and disputing, could occur simultaneously in our data. With increasing cognitive dissonance, some respondents might go into avoidance, while others dispute. If this was the case, the response behaviors could cancel each other out concerning the observed group means in response time. Including more information about the distribution of response times allows us to identify and compare different prevalences of response behavior across dissonance groups.

As a robustness check, all of the presented regression models were also run with respondent sex, age and highest educational degree as controls. Differences are not shown here as results were absolutely negligible, indicating that random assignment to the experimental treatment worked well.

## 6) RESULTS

### 6.1) Descriptives on mainstream and protest ideology

The most crucial concept within our set of explanatory variables is the distinction if a respondent is categorized as ideologically leaning toward the mainstream society or the protest movement. To confirm its validity, Table 3 shows some results of cross-checking the ideology indicator with other related variables in the data set (see Table 3; full question wordings in Appendix A.2, A.3 and A.5). As expected, respondents that have been categorized as leaning toward protest ideology, show more extreme attitudes on the direct attitude questions referring to each vignette topic: As we would expect, they score lower on risk perception, tend to be against masks and vaccines (means of opinion score: 1.28 vs 2.96). Moreover, they tend to hold less diverse opinions (means of standard deviations: 0.82 vs 0.88), although the difference fails to reach statistical significance in a mean comparison test ( $p=0.169$ ). Interestingly, they also report significantly more gut-based and less evidence-based decision making than the mainstream society. In addition, they are more likely to agree to statements suggesting that truth is a relative concept that depends on who is in power. With regard to trust in media, respondents who sympathize with the protest ideology are more skeptical than other respondents. This is somewhat counterintuitive for social media, because other studies suggest that they tend to consume them more (Faas et al. 2022). Overall, judging from these correlations with other survey responses, the indicator seems to measure some meaningful differences between ideology groups.

Table 3: Means of explanatory variables by identification with protest movement

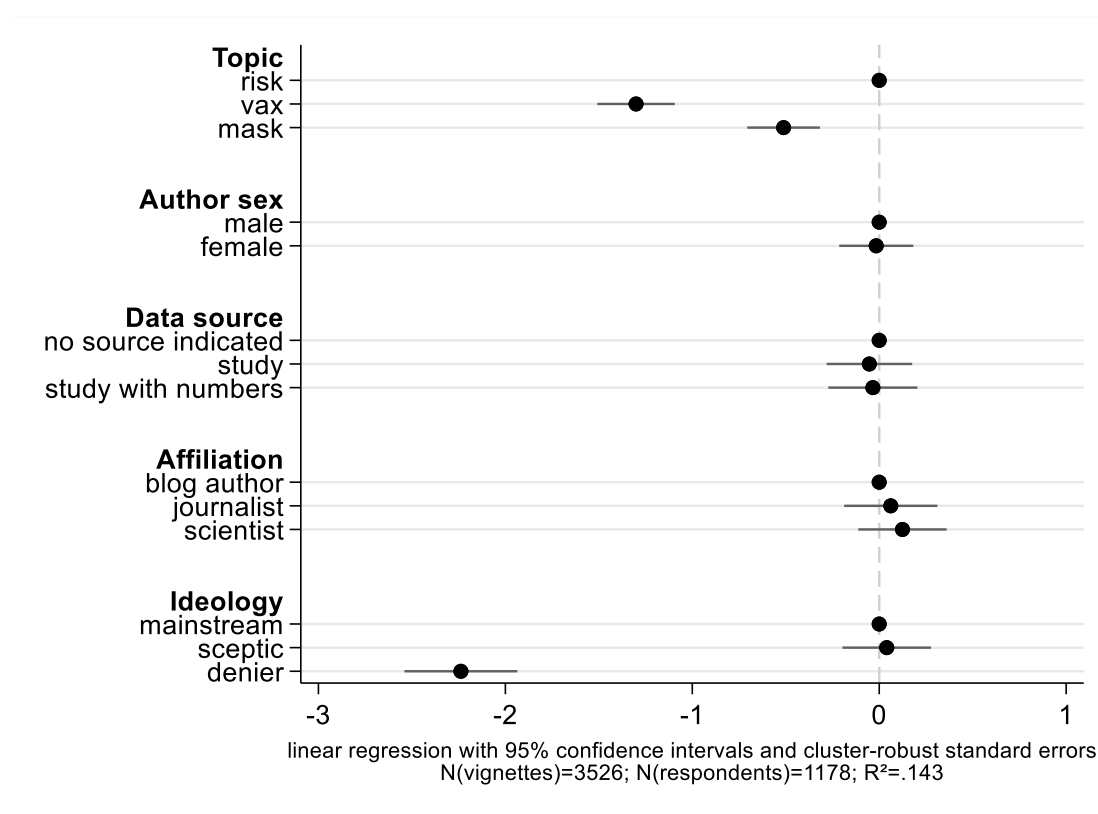
	protest movement		mean comparison test
	0	1	
<b>single-item questions on vignette topics</b>			
risk perception low-high (scale 0-4)	2.8	1.6	p<0.001
in favor of mandatory masks indoors (scale: 0-4)	2.8	1.1	p<0.001
usefulness of vaccine (scale: 0-4)	3.3	1.3	p<0.001
<b>trust in media</b>			
trust in TV (scale: 1-7)	3.5	1.6	p<0.001
trust in newspapers (scale: 1-7)	3.7	1.7	p<0.001
trust in social media (scale: 1-7)	2.7	2.2	p<0.001
<b>decision making</b>			
gut-based (scale 1-4)	2.8	3.0	p<0.001
evidence-based (scale 1-4)	3.2	3.0	p<0.001
embracing relative truths (scale 1-4)	2.4	3.2	p<0.001

## 6.2) Credibility evaluations of media contents (main effects)

Turning to our first research question, shows the main effects of all experimentally varied vignette dimensions on respondents' credibility judgments. The average vignette evaluation was 5.7 on the response scale from 0 "not at all credible" to 10 "very credible". Vignettes on risk perceptions were on average rated slightly more credible (mean: 6.3) than media contents on masks (mean: 5.8) and vaccines (mean: 5.0). Judging from the standard deviations, the latter also was the most controversial topic (sd: 3.4 vs 3.0 for masks and 2.9 for general risk perception).

Respondents on average found vignettes with mainstream and middle position ideology more credible (means: 6.4 and 6.5) than those denying any danger related to Covid as well as any usefulness of measures (mean: 4.2). These numbers reflect the fact that the majority in the sample belongs to the mainstream ideology group. We cannot say anything on how these evaluations differ by respondent ideology yet. However, the result already suggests that vignette ideology is the strongest predictor for the perceived credibility of a media content. At least on average across the sample, the objective quality indicators show no effects on the vignette evaluations at all. Nor does the author's sex.

Figure 2: Linear regression of perceived credibility on vignette dimensions (main effects)



### 6.3) Confirmation bias: interaction of pre-existing opinion and vignette ideology

To assess conformation bias, that is, potential differences in evaluation strategies dependent on respondent ideology (as outlined in our second research question), the same regression model as before is calculated separately for those who expressed a mainstream, middle and denier attitude toward the vignette topic in the respective direct question. All other vignette dimensions, including the quality indicators, are included as controls. Note that all vignette dimensions were experimentally varied, meaning that all groups are comparable in terms of all other vignette dimensions, including quality.

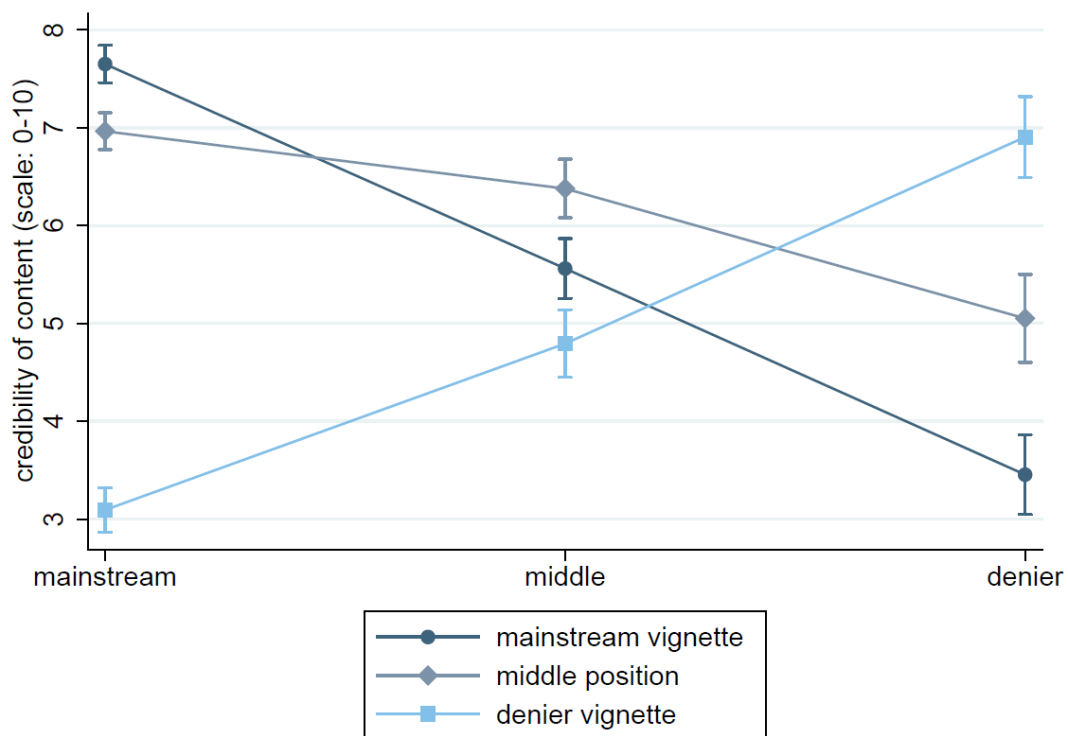
Figure 3 shows the reported credibility evaluations on the vertical axis, while the horizontal axis indicates respondent ideology on the vignette level (for same graph by vignette topic, see Appendix C). Vignette ideology is depicted by different marker symbols and colors.

Crucially, the graph shows huge, statistically significant differences in credibility evaluation between all of the compared groups.

Respondents holding a mainstream ideology toward a vignette topic, evaluate belief-consistent mainstream vignettes (indicated by dots in dark blue) as most credible (on average 7.7 out of 10) and middle position vignettes (marked as grey diamonds) slightly less credible (7.0), while denier vignettes (see squares in light blue) are judged with a credibility value of only 3.1. The opposite is true for respondents with denier ideology toward the vignette contents: They rate denier vignettes the highest (6.9) and mainstream vignettes the lowest

(3.5), with middle position vignettes ranging somewhere in between, in the middle (5.1) of the credibility scale. Respondents holding a middle position find middle position vignettes most credible. Interestingly, they overall tend to evaluate vignettes a bit more equally (although there are still significant differences between vignette ideologies), maybe because they experience less cognitive dissonance when reading mainstream and denier vignettes that are logically closer to their own opinion than e.g. a denier vignette to a mainstream respondent's view. In other words, they might have fewer reasons to engage in motivated reasoning.

Figure 3: Linear regression of perceived credibility on interaction of vignette ideology and pre-existing opinion (on vignette level)



Overall, these findings are strong evidence for confirmation bias, an ideology-driven evaluation strategy irrespective of objective content quality or personal ideological leaning.

#### 6.4) Confirmation Bias: interactions of quality cues, vignette ideology and respondent ideology

We will now take a closer look at how the quality cues are perceived by mainstream respondents and supporters of the protest movement when they are confronted with belief-consistent vs belief-inconsistent vignette content. To do this, we condense some of the information provided in Figure 3: The distinction between mainstream, middle and denier attitude on vignette level is now replaced by the person-level ideology index. This strategy seems appropriate as within-respondent variation in ideology is small.

As before, we plot regression results into graphs that show credibility evaluations on the vertical axis and use different marker symbols to indicate vignette ideology. This time, however, the horizontal axis refers to the two quality indicators included in the media contents: The left window shows the cited data basis (no source / study / study with concrete numbers), the right window the author identity (blogger, journalist, scientist).

Figure 4 shows these analyses for the mainstream society, that is, for those respondents scoring 0 on the ideology index, while Figure 5 depicts those leaning toward protest ideology. In both windows of Figure 4, the fairly horizontal lines indicate that the objective quality of media texts makes little difference for the credibility evaluation. Instead, mainstream respondents evaluate media contents that correspond to their own ideology as the most credible with mean values of around 7 (see dark blue circles). Vignettes with a middle position ideology range just below. Contrastingly, media contents with denier ideology range far behind with mean values of between 3.6 and 3.8 on the credibility scale. The slight rise of the dark blue circles in the right-hand window shows that vignettes gain a small credibility boost when scientists are mentioned as authors. Interestingly, this effect only appears for mainstream vignettes but not for middle position vignettes (difference significant with  $p=0.02$ ), that is, when the text is in line with one's pre-existing opinion. However, a difference-in-difference estimator testing if the scientist effect (ref. blogger) varies between denier vignettes and mainstream vignettes fails to reach traditional levels of significance ( $p=0.08$ ).

Figure 4: Linear regression of perceived credibility on interaction of objective quality, vignette ideology for mainstream respondents (on respondent level)

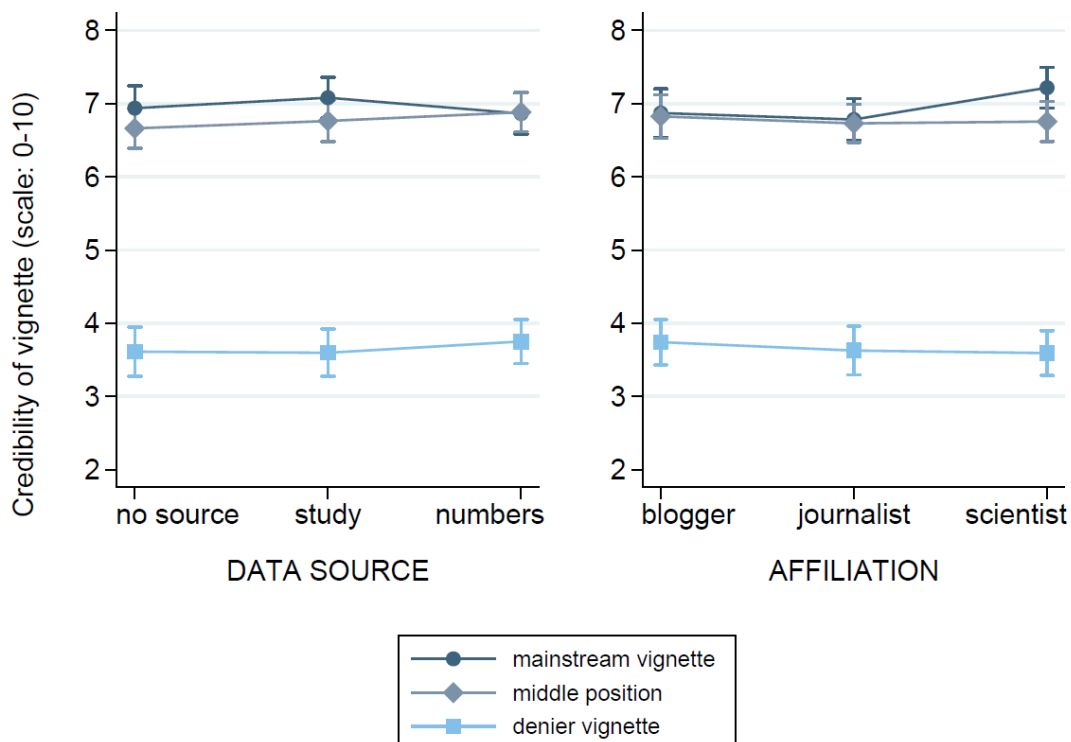


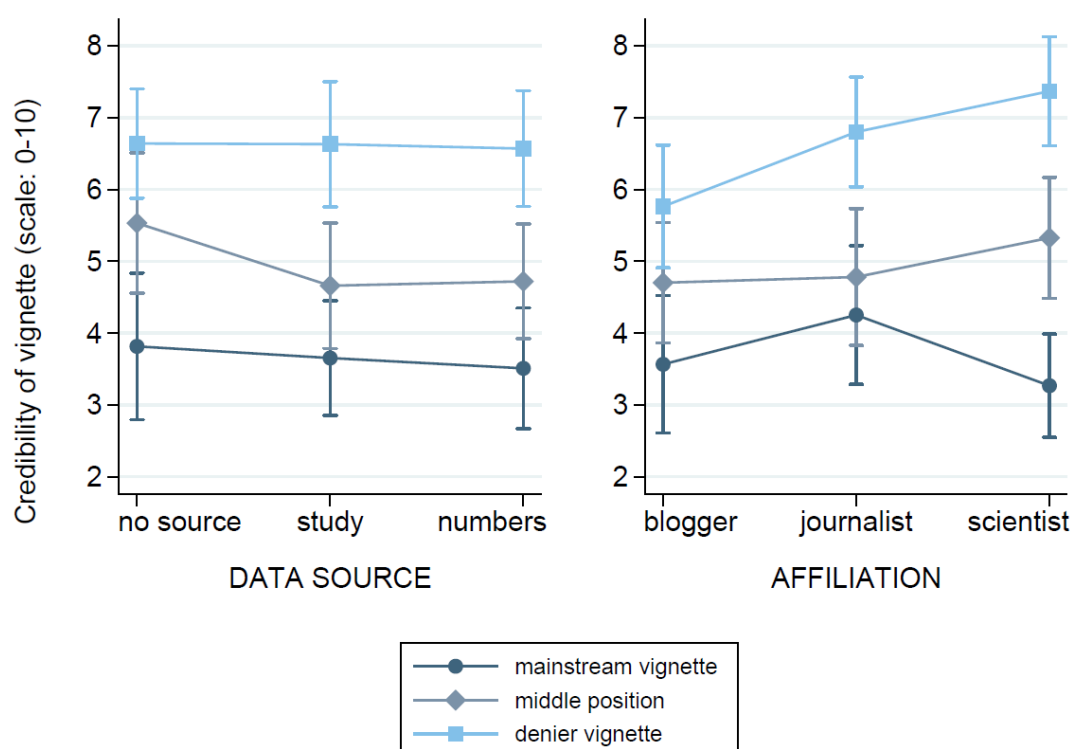
Figure 5 shows the same graph for respondents that we categorized as leaning toward protest ideology by the respective index. At the first glance, it becomes apparent that there are comparatively small numbers of respondents with protest ideology in our data set and estimates are much less precise than those for the mainstream society (as reflected by the larger confidence intervals).

With regard to the ideology of the media content, we see the exactly opposite picture: The protest movement rates texts that represent denier ideology as the most credible. The light blue lines are always highest, vignettes with mainstream content are furthest down the credibility scale. Once again, this is clear evidence for confirmation bias.

If quality criteria were relevant for credibility evaluations, we should see rising lines.

However, the observed pattern is rather unsystematic. An exception is the light blue line in the right window, which shows a positive effect of authorship on credibility assessment for denier vignettes. As for the mainstream society, we can interpret this as a tendency to take author affiliation into account asymmetrically, if it can help to justify a pre-existing belief (difference-in-difference estimator testing if the scientist effect (ref. blogger) differs between denier vignettes and mainstream vignettes:  $p=0.012$ ).

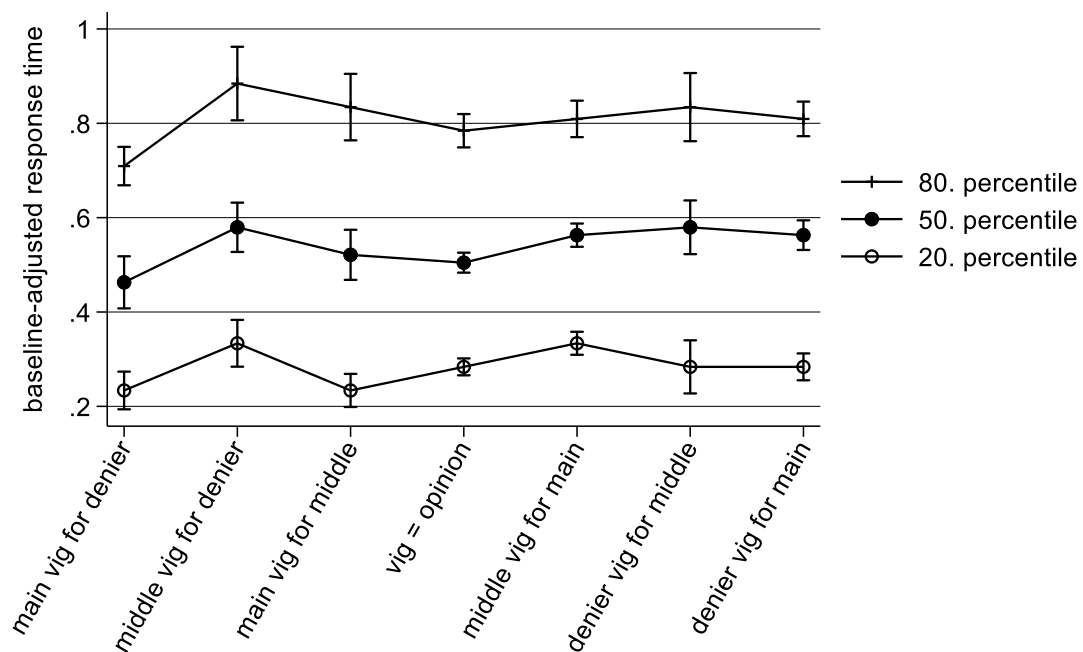
Figure 5: Linear regression of perceived credibility on interaction of objective quality, vignette ideology for protest movement (on respondent level)



## 6.5) Confirmation bias and response times

In a last step, we investigate the relationship between confirmation bias and response time. As argued above, there are two contradictory potential mechanisms driving the relationship between exposure to belief-(in)consistency and response times: disputing and avoiding. Figure 6 shows the respective analysis to examine such response patterns. It is based on quantile regressions of response times per vignette, estimating response times for the 20<sup>th</sup>, 50<sup>th</sup> and 80<sup>th</sup> percentile across levels of cognitive dissonance (connected with lines for better readability). Note that the depicted response times are adjusted for individual baseline speed, with a value of e.g. 0.5 indicating that, compared to the baseline module, respondents took half the time to answer the vignette. Different levels of belief (in)consistency are indicated on the horizontal axis, with matching vignette and respondent ideology depicted in the middle and increasing cognitive dissonance toward the extreme points of the scale.

Figure 6: Percentiles of baseline-adjusted Response Times per Vignette by Cognitive Dissonance



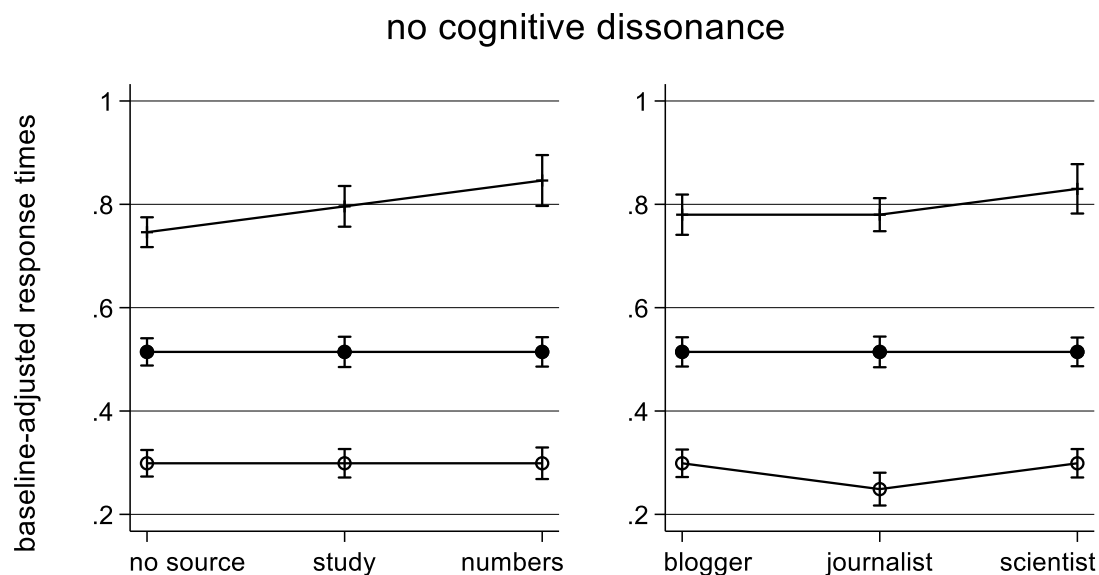
If avoidance took place, we would expect respondents to process faster toward the edges of the x-axis, creating a symmetrical inverse u-shaped pattern with belief-consistency at the midpoint. This should particularly show in the 20<sup>th</sup> percentile line, which depicts the maximum response time for the fastest 20 percent of respondents for each dissonance group. Similarly, disputing of belief-inconsistent contents should be reflected in a u-shaped pattern, particularly in the 80<sup>th</sup> percentile line.

In practice, however, this is clearly not what we see. If anything, mainstream vignettes that are answered by deniers are processed slightly more shortly than perfectly belief-consistent

vignettes. At least the comparisons of the 20<sup>th</sup> and 80<sup>th</sup> percentile are significant for this group, which could hint toward avoidance in this subgroup of extreme cognitive dissonance. However, we would not want to overinterpret this finding. Some other estimates also become significant without any good theoretical explanation, compared to the reference group who experienced no cognitive dissonance (e.g. mainstream vignettes for middle position and middle vignettes for mainstreamers compared to belief-consistency at the 20<sup>th</sup> percentile). Overall, the observed patterns are highly unsystematic. With R<sup>2</sup>-values of 0.01, the model fits are very weak, and corroborate the general impression that we cannot find any clear evidence for either of the theoretically proposed mechanisms.

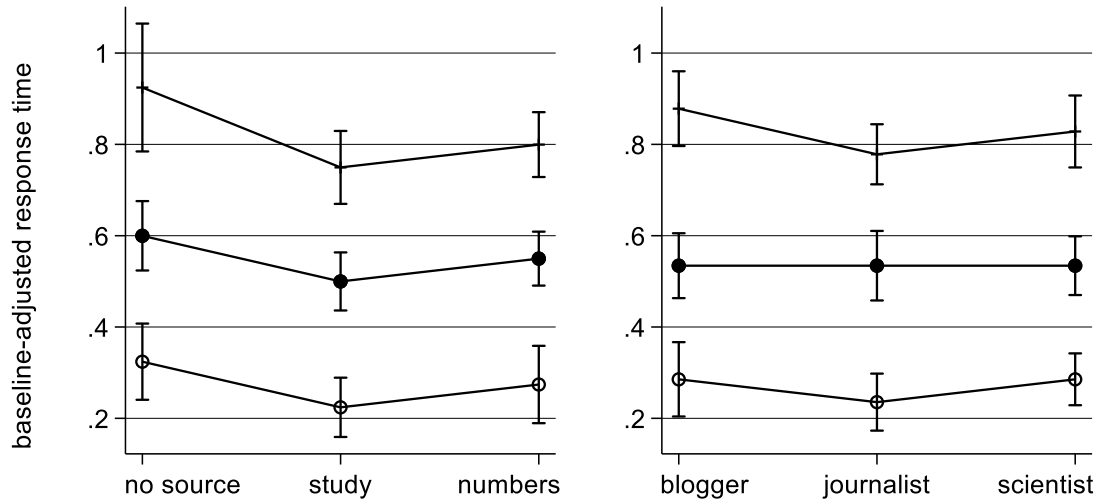
Figure 7 additionally incorporates the quality cues. The graph again presents baseline-adjusted response times at the 20<sup>th</sup>, 50<sup>th</sup> and 80<sup>th</sup> percentile of the distribution, dependent on data source (left panel) and author affiliation (right panel) and distinguishing three groups of cognitive dissonance: no or little cognitive dissonance (equivalent to the three middle categories in Figure 6) in the first row, high cognitive dissonance experienced by the protest movement (left rim of the scale in Figure 2) in the second row, and high cognitive dissonance experienced by respondents with a mainstream or middle position ideology (right rim of the scale in Figure 2) in the third row. Each line stems from one quantile regression model.

Figure 7: Percentiles of baseline-adjusted Response Times per Vignette by Groups of Cognitive Dissonance and Quality Cues

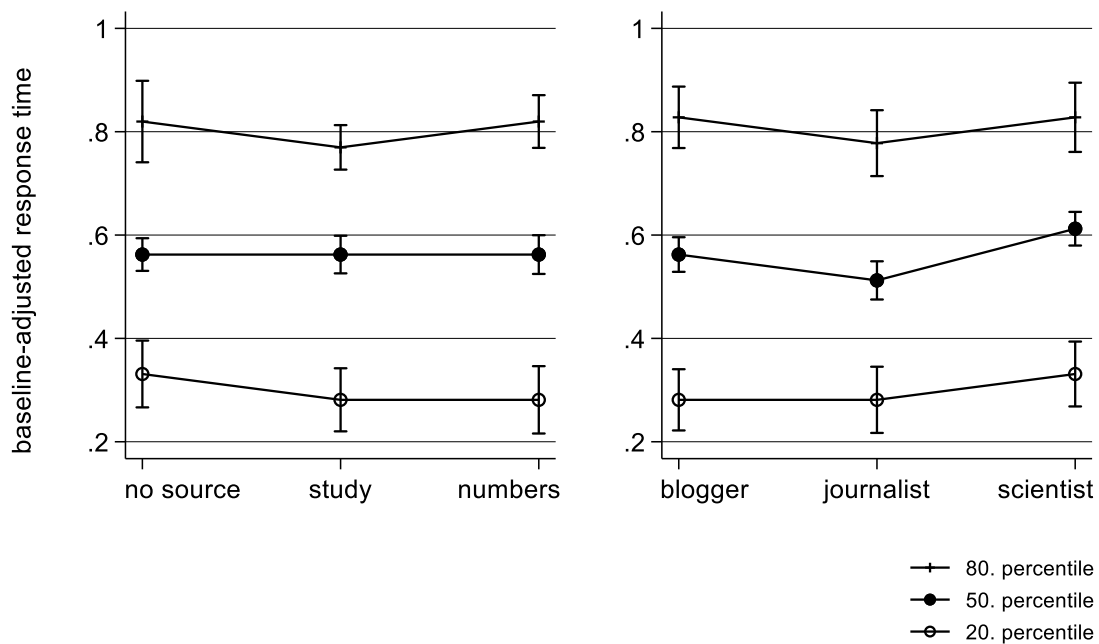




### dissonance: main/middle vig for denier resp



### dissonance: denier vig for middle/mainstream resp



Again, the picture is inconsistent. Overall, latency times within dissonance groups show little variation by data references and author affiliation. Few effects are significant and they do not allow for consistent overall conclusions concerning the hypothesis that inconsistent cues trigger more systematic processing. More precisely, respondents who lean toward protest ideology show significantly longer processing times at the 20th, 50th and 80th percentiles when they are asked to evaluate counter-attitudinal contents without any source indicated. In the context of the Covid-19 pandemic, one could argue that the combination of mainstream messages with poor quality cues is unusual and therefore incentivizes more cognitive

disputing. However, this finding does not generalize to the cues on author affiliation or the group of mainstream respondents.

The only clear – and unexpected – trend is that media contents that mention studies engage some readers more than those without any such references, but only when they experience low or little cognitive dissonance (first row). In this group, increased latency times at the 80th percentile could reflect readers with a high need for cognition and/or numeric literacy who enjoy thinking about statistics without having any clear incentive to engage in motivated reasoning.

## **7) DISCUSSION AND CONCLUSION**

This study contributes to a deeper understanding of how individuals evaluate the credibility of media content and how such processes contribute to polarization. We examined how the structural logic and algorithmic dynamics of the internet facilitate the dissemination of misinformation and the deliberate spread of disinformation by political and other actors, and highlighted the challenges this creates for users who increasingly rely on digital platforms and social media for news consumption. Drawing on dual-process theory and the concept of motivated reasoning, we utilized the COVID-19 pandemic as a case study and example of political polarization that was accompanied by intensive and heated debates on social media. Our empirical analyses focused on the relative importance of confirmation bias and established quality cues in shaping individuals' credibility judgments of media contents in the context of online news consumption - a setting characterized by rapid judgments made under conditions of limited contextual information. This specific application goes beyond existing psychological laboratory experiments on confirmation bias: We used an innovative factorial survey experiment inspired by authentic media contents to combine the internal validity of an experiment with the external validity of a general population sample. By moving beyond dichotomous measures of ideology, we were able to capture more nuanced ideological orientations and associated experiences of cognitive dissonance.

Each respondent evaluated the credibility of three different short texts on Covid-19-related topics, which could be the beginning of a blog or an online newspaper article. Among other things, the vignettes vary experimentally in their source credibility cues (author affiliation and data references) and underlying ideology (mainstream / middle position / protest movement), which was compared to different direct assessments of respondent ideology later in the questionnaire to assess confirmation bias as well as the experienced levels of cognitive dissonance.

We found strong evidence for confirmation bias: The tendency to maintain already existing opinions even if new, credible information contradicts them is a central mechanism in understanding how people perceive and evaluate media contents.

Revealingly, in our study, the only context in which a quality cue influenced vignette judgments was one that reflected confirmation bias. Respondent (and particularly those of the protest movement) perceived statements by scientists as more credible, but only when they confirmed pre-existing opinions, that is, if they didn't experience cognitive dissonance. At the

same time, this mirrors real-world dynamics during the pandemic: A small number of medical professionals who backed the protest movement gained substantial visibility online, while the majority of scientists were widely dismissed as part of a perceived conspiracy.

Although it seems likely that differences in media consumption patterns have contributed to the development of the protest movement and its polarization from mainstream society, both groups at the end of the ideological spectrum do not differ much in their evaluation strategies. In other words, supporters of the protest movement are not more susceptible to confirmation bias than members of the mainstream society. Instead, the examined evaluation strategies seem universal, that is, rooted in the way the human brain works. Only respondents in the ideological middle, who were presumably less affected by cognitive dissonance and motivated reasoning, evaluated media contents across different ideological positions (and with comparable quality cues) as more evenly.

While we were successful in uncovering the respective importance of quality cues and confirmation bias for credibility evaluations in different societal subgroups, our analysis of response times could not determine which types of confirmation bias are mainly at work when individuals are confronted with belief-inconsistent information. Put differently, we did not find systematic correlations between belief-inconsistency and short or long response times, which would have suggested that respondents predominantly avoid or refute such information, respectively.

Given scientists' inherent inclination toward analyzing and understanding information, some may argue that our quality cues did not provide sufficient information to accurately judge the quality of the presented news contents. This is a reasonable concern, particularly in situations where individuals are motivated to engage in deeper cognitive processing to learn more about a topic. Indeed, we cannot rule out the possibility that participants with a high need for cognition found it challenging to evaluate our media content - although feedback from our pretest respondents did not indicate such difficulties. However, we would argue that in real life situations, and particularly on social media, individuals often dedicate only brief attention spans to single news items. They might even form judgments about content and quality based on a quick glance at the headline or a skim-read of the first sentence, which decides if they want to continue reading. From this perspective, our experimental set-up might not have captured the only possible, but a realistic and frequent scenario of news consumption.

It is noteworthy that compared to earlier studies, quality cues almost played a negligible role for credibility evaluations in our survey experiment. This might be due to the highly polarized Covid-19-related topics we implemented. However, this finding might also suggest a more general shift in how individuals evaluate media content, possibly reflecting the increasing difficulty of assessing source credibility in online environments. Future research should examine this possibility in more detail.

The practical implications of our research extend to media literacy programs, communication strategies, and interventions aimed at countering misinformation. Based on our findings, we would argue that informing about facts alone is not a sufficient measure against polarization. At least once an impression is formed, it persists and is largely immune to good arguments, due to motivations to maintain a positive self-perception, values or group identities that counteract unbiased reasoning. Paired with the massive speed, with which information can

spread on the internet, misinformation can very quickly become established as a supposed truth if not countered quickly.

Since scientists came with a small credibility bonus in our study, it might be worth exploring in future research if educational interventions about how science works might help restore some faith in the discipline. Particularly, the logic of hypothesis testing, the general idea of defining objective standards to determine if an effect exists, the expression of uncertainty as a quality indicator might need some training to be fully appreciated. Such measures might also help people to identify misinformation and discourage the convenient relativism of several co-existing possible truths.

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