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The Role of Media Use and Misinformation Perceptions in Optimistic Bias and Third-person Perceptions in Times of High Media Dependency: Evidence from Four Countries in the First Stage of the COVID-19 Pandemic


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ABSTRACT

When societies are struck by large-scale disruptions, biases in citizens' personal risk assessment and the spread of misinformation are often reason for concern. As a contribution, this study aims to link individuals' biased perceptions of self-other asymmetry—i.e., optimistic bias in risk assessment and third-person perception regarding undesired media influence—to different patterns of news consumption and misinformation perceptions. To study these phenomena, we distributed an online survey in the early phase of the COVID-19 pandemic among citizens from the US, the UK, the Netherlands, and Germany ($N = 1,912$). The findings offer consistent support for bias beliefs: Compared to others, citizens from all four countries perceived themselves as less vulnerable to health and financial risk—i.e., optimistic bias—as well as the influence of misinformation—i.e., third-person perception. In a next step, we provide novel insights into how general news use can be associated with lower optimistic bias regarding perceived personal risk, while intentional exposure to issue-specific information and misinformation perceptions can relate to higher optimistic bias and third-person perceptions. These relationships were found to differ across individual countries. Overall, this study provides novel insights into how media use and perceptions relate to perceived invulnerability to potential harm, which, in turn, might impede pro-social intentions during crises surrounded by the omnipresence of misinformation.

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 Supplemental data for this article can be accessed on the [publisher's website](#).

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Introduction

In times of major societal disruptions, the news media play a central role in informing the knowledge, behavior, and attitudes of citizens (Boukes et al., 2019; Van der Meer, 2018). However, in such heightened crisis times characterized by high media dependency, like the outbreak of SARS-CoV-2 in early 2020, the information available to individuals to base their judgments on is often limited and not always accurate (e.g., Tan et al., 2015). In addition, citizens do not trust all information in times of societal disruptions (Kleis Nielsen et al., 2020). In other words, while the need to have access to accurate and trustworthy information is high in a context of uncertainty caused by a crisis situation, the information environment impedes citizens' accurate understanding of the situation at hand. The context of such societal disruptions may therefore imply that citizens' evaluations and behaviors can be based on biased beliefs. In this information ecology characterized by an overload of information and the fast spread of misinformation (e.g., Hameleers et al., 2021; Van Aelst et al., 2017), our paper seeks to understand how citizens arrive at risk perceptions relative to others in their social environment. Therefore, we ask, when uncertainty and distrust about information is mounting, how do citizens arrive at their perceptions of being at risk for undesirable outcomes?

One of the main distortions in individuals' risk assessments relates to consistent underestimation of personal risk. This phenomenon is generally known as the *optimistic bias* hypothesis, which holds that people generally believe that they personally are less likely to experience negative consequences than others (Weinstein, 1980, 1989). Such biased perceptions stem from cognitive mechanisms such as the desire to protect a superior self-image (Gunther & Mundy, 1993; Perloff, 1999). In times of public-health crises, this optimistic bias might mean that people's estimation of personal vulnerability to potential risk or harm is relatively low when they engage in comparative assessment (Rittichainuwat et al., 2018). Next, in the specific context of news media, the same kinds of mechanism can relate to self-other asymmetry regarding media effects. This *third-person perception* refers to a lower perceived chance of undesirable influences of media content on oneself compared to others (Davison, 1983). The origin of optimistic bias and third-person perception is an essential research object, as these perceptions are assumed to have negative risk-related behavioral effects (Taylor & Brown, 1988; Wei et al., 2008). This study's contribution lies in exploring whether such consequential distortions are related to different news diets and perceptions that erroneous or misleading information prevails (i.e., misinformation perceptions).

Even though perceptions of optimism and third-person perceptions are considered a persistent phenomenon, there are certain personal and

situational components that can determine the extent to which individuals display biased perceptions (Cho et al., 2013). Since news consumption is considered a crucial factor in the formation of risk perceptions and interpretations of a crisis situation (Van der Meer, 2018), this study specifically highlights the role of news exposure and perceptions. Especially when the availability of information is low or inconclusive—as often the case in crisis situations—news use may be a source of more skewed interpretations among certain citizens. Yet, extant research has shown mixed findings when it comes to the link between media use and biased perceptions (e.g., Cho et al., 2013; Wei et al., 2008). By distinguishing between citizens' general news use and intentional exposure to issue-specific news content, this contribution aims to shed light on how different types of media use can be associated with biased perceptions of self-other asymmetry.

As a next contribution, this study brings the phenomenon of the omnipresence of misinformation into the equation to better understand how potentially biased risk beliefs are formed. With the spread of inaccurate information, citizens are increasingly unsure about the accuracy and honesty of information (e.g., Van Aelst et al., 2017). Especially in times of societal disruption and crises, when information need is high but conclusive knowledge is often absent, our media environments are inevitably flooded with an alarming amount of misinformation (Tan et al., 2015). Familiarity with the possibility that information systems can present false bits of information can be vital for citizens to better understand the situation at hand. Yet, such awareness of the presence of misinformation might also risk diminishing perceptions of personal susceptibility, in comparison to others, to certain threats or other consequences of being misinformed. Therefore, the current research endeavor aims to provide novel insights into the association between perceptions of misinformation with optimistic bias and third-person perceptions.

The current study specifically relies on the case of the COVID-19 pandemic, as this provides a valuable study case to explore biases in risk assessments in the context of contemporary media environments characterized by complex news exposure patterns and the presence of misinformation. We rely on survey data from four countries (US, UK, the Netherlands, and Germany ($N = 1,912$)) collected in the first stage of the pandemic. To explore biased perceptions of self-other asymmetry, the survey asks specifically about citizens' (1) relative estimation of personal health and financial risks (i.e., optimistic bias in risk assessment)—and (2) estimation of the chance of being influenced by the spread of misinformation— (i.e., third-person perceptions regarding undesired media influence). These biased risk beliefs are subsequently linked to people's general news use, COVID-19 specific news selection, and perceptions of misinformation.

News media in times of societal disruption

News media play a crucial societal role in providing relevant information during societal disruptions and crisis situations (Van der Meer, 2018). News coverage and attention can shape the evolution of a crisis or further escalate its consequences through forming audiences' collective understanding of what is going on. Accordingly, media dependency theory suggests that people are more dependent on the (news) media in times of crisis and heightened uncertainty surrounding new developments (Boukes et al., 2019). Yet, the sudden and unpredictable nature of such societal disruptions makes it difficult for media to accurately report on such events. Even in the absence of factual or conclusive information, news media are pressured to report on such crisis situations due to their newsworthy character (Maier, 2010). Hence, the disruptive nature of a crisis creates sincere problems for accurately informing audiences. Indeed, existing crisis and risk research has empirically shown how mis- and disinformation prevails in the context of, for example, infectious disease outbreaks (Drezde et al., 2016).

Conceptually, we can make a distinction between misinformation and disinformation (also see, e.g., Hameleers et al., 2021; Wardle & Derakhshan, 2017). Misinformation can be understood as inaccurate or false information that is not necessarily intentionally deceptive, or information that is not based on relevant expert knowledge (e.g., Vraga & Bode, 2020). Disinformation, in contrast, can be understood as information that is created or disseminated with the aim to deceive, disrupt or mobilize (e.g., Bennett & Livingston, 2018). As the intention to deceive recipients is hard to establish at times, arguably even more so during hectic crisis situations, and considering that both intentionally and unintentionally disseminated inaccurate content can cause harm, we understand misinformation as an umbrella-term that may capture both "honest" mistakes and intentionally misleading information. We specifically focus on *perceptions of misinformation* (also see, Hameleers et al., 2021): Beliefs related to the inaccuracy and dishonesty of information disseminated by various (news) sources.

The dissemination of misinformation has resulted in concerns about the formation of misperceptions in light of being exposed to inaccurate or conflicting information (Thorson, 2016; Waisbord, 2015). Accordingly, scholars have argued that our current information era is characterized by post-factual relativism (Van Aelst et al., 2017). The epistemic premises of factual knowledge are considered to increasingly be subject to distrust and doubt rather than collective consensus. Thus, in order to arrive at well-informed perceptions, audiences are faced with the challenge of navigating through an overload of news, of which numerous pieces of information might be factually incorrect or later argued to be inaccurate.

In the context of high media dependency and the omnipresence of mis- and disinformation, it is important to study how audiences' media use and perceptions relate to biased beliefs regarding their personal risk of being affected by a crisis. Accordingly, in the remainder of the theory section, we address well-established self-other perceptual biases related to risk assessment, namely the optimistic bias, and in the context of media influence, the third-person perception. In a next step, we aim to conceptually relate these perceptual biases to audiences' general media use, search for crisis-specific information, and their perceptions of the presence of misinformation. With the current study, we aim to provide new insights into how biased perceptions during crisis situations take shape in information settings characterized by information overload and uncontrolled spread of misinformation.

Biased perceptions of self-other asymmetry and risk assessment: Optimistic bias

Risk assessments are inherently subjective constructs. How individuals appraise the risks of a given situation determines to a considerable extent how they will act during hazard or crisis situations (e.g., Rittichainuwat et al., 2018). As such, numerous academic studies have been devoted to better understand people's risk estimations and identify biases in these processes. One source of systematic biases in risk assessment relates to individuals' tendency to make assessments comparatively (Masiero et al., 2018; Weinstein, 1989), especially when they judge the probability of encountering negative life events like diseases. This multidimensional nature of risk judgments is explained by the impersonal-impact hypothesis (Tyler & Cook, 1984). This hypothesis assumes that individuals tend to distinguish between two different levels of risk judgment: the societal level (i.e., risk assessment for others)—and the personal level—(i.e., risk assessment for themselves).

In their comparative risk assessment, individuals' excessive and unwarranted optimism may be a particularly robust source of bias. They are generally overconfident and consider themselves less vulnerable to risks than others. This phenomenon is conceptualized in risk literature as *optimistic bias* (Weinstein, 1980) and can be defined as a psychological tendency that people will think they are less likely to experience negative events, but more likely to experience positive events than others (Gouveia & Clarke, 2001). This process has been taken into account in several health and risk domains (Masiero et al., 2018). Hence, at times, people might perceive their personal risk as lower compared to other and see themselves as relatively more competent to engage in desired behavior. Optimistic bias is not a complete disregard of potential risks, but rather

the failure to respond to information about risks in a consistent way when assessing one's own versus others' vulnerability to potential harm (Branstrom et al., 2005). This bias can be functional since it helps to reduce feelings of anxiety and can boost perceived levels of control (Taylor & Brown, 1988). Yet, in the context of health risk for example, biased optimism can be maladaptive: The illusion of invulnerability can demotivate people to engage in protective behavior (Cho et al., 2013; Weinstein, 1989).

Literature has suggested numerous underlying mechanisms that can account for the optimistic bias: (1) egocentric thought, (2) self-esteem enhancement, (3) psychological distance, (4) illusion of control, or (5) cognitive errors. First, people have a large amount of knowledge about themselves, but little knowledge about others. This form of egocentrism can lead to people's failure to consider others' precautionary behavior (Weinstein, 1989). Second, underestimating one's own vulnerability to risk and overestimating one's own skills enhances self-esteem and creates a sense of control (Weinstein, 1980). This stems from a desire to protect a superior self-image by downplaying one's susceptibility to undesirable influences (i.e., self-serving bias; Gunther & Mundy, 1993; or self-enhancement bias; Perloff, 2002). Third, psychological distance relates to a form of differentiation made regarding the perception of how alike others are (Chapin, 2000). If this distance becomes larger (*best friends, students in this class, average Americans*, etc.), the level of perceptual bias also increases (Liberman et al., 2007), which leads to individuals' beliefs that others are more vulnerable (Chapin, 2000). Fourth, an illusion of control, where people believe they have overall more control over events when comparing themselves with others (to secure a superior self-image), is commonly associated with optimistic bias (McKenna, 1993). Finally, cognitive errors (e.g., tendency to compare oneself with negative examples, draw conclusions about the future based on past experiences) can explain perceptions of optimistic bias (Shepperd et al., 2002).

Previous literature demonstrates that perceptual optimistic bias is a prevalent and robust phenomenon. People estimate personal risk to be lower for themselves than for others in various health and risk-judgment contexts, for example, the likelihood of becoming a victim of cancer (Masiero et al., 2018), cardiovascular diseases (Masiero et al., 2018), tsunamis (Rittichainuwat et al., 2018), bird flu (Wei, Lo & Lu, 2008), HIV/AIDS (Chapin, 2000), and H1N1 flue (Cho et al., 2013). First studies from the US and Italy already report that optimistic people can be more likely to underestimate their COVID-19 personal risk compared to others' risk (Monzani et al., 2021; Park et al., 2021). Accordingly, consistent with extant research, we expect—in the context of COVID-19 pandemic—that

H1: People estimate that it is less likely that they, compared to others, will (a) get infected, (b) become seriously ill when getting infected, and (c) suffer financial consequences.

Biased perceptions of self-other asymmetry and media: Third-person perceptual gap

Relating perceived self-other asymmetry to the context of media influence, scholars have studied the third-person perceptual gap. Individuals do not only display bias in their risk assessment of themselves and others, but also regarding the effects of media usage and media content on them. The third-person perception, in particular, refers to a relative underestimation of the effect of media messages on oneself, and an overestimation of such effects on others (Davison, 1983). It stems from self-motivated social desirability where one's susceptibility to undesirable influences of mass messages is downplayed to dissociate oneself from others who are influenced (social-distance corollary; Davison, 1983).

Due to the similarity of the phenomena of optimistic bias and third-person perceptual gap, scholars have suggested that the third-person perception can be a product of the optimistic bias (see, e.g., Chapin, 2000; Gunther & Mundy, 1993). Some scholars argue that they are, nevertheless, different. Salwen and Dupagne (2003; see also Wei et al., 2007) show that the two perceptions are not correlated, and that media use does not impact third-person perceptions, whereas it does impact optimistic bias (specifically TV having a positive effect on optimistic bias, and newspaper and radio use having negative effects). For this paper, while the same kinds of self-processes might underlie both phenomena (Tesser & Cornell, 1991), we do not consider third-person perceptions an optimistic bias. Both biases share a perceptual component where individuals are aware of others in their social judgment (Salwen & Dupagne, 2003) and where their interpretations can be attributed to self-serving motivation (Wei et al., 2007). Yet, the third-person perception is argued to be a biased judgment specifically related to media influence, while optimistic bias entails a social psychological mechanism of bolstering self-esteem in self-other comparisons regarding the likelihood of experiencing a risk (Wei et al., 2007). Hence, the biased optimistic perception is more about the likelihood of experiencing an event or a risk that would have a real-world outcome, whereas third-person perception is more about a biased interpretation of susceptibility to media message influence about an event. Both biased perceptions of self-other asymmetry are therefore considered parallel processes of social judgment that involve different mechanisms. Third-person perceptions tap into an individual's estimation that the desirable outcome of not being affected

by certain messages is more likely to happen to themselves compared to others. Such a self-other judgment would be in line with a better-than-average heuristic (Shepperd et al., 2002). The social desirability of not being impacted by certain news coverage can result in optimistic beliefs when people engage in comparative assessment. In addition, people's belief that they have more control over events than others (comparative control illusion; McKenna, 1993) could lead to bias about being better than others at securing positive and avoiding negative outcomes, such as undesired media influence (Klein & Helweg-Larsen, 2002). Accordingly, we measure both optimistic bias and third-person perceptions as separate constructs where the former is more about self-other asymmetry biased beliefs on risk assessment and the latter about self-other asymmetry biased perception concerning undesired media effects—which is especially relevant to consider in light of misinformation beliefs.

Third-person perceptions have been observed in numerous media contexts. For example, users generally think that others are both more negatively and more positively affected by using Facebook (Tsay-Vogel, 2016). Health-related media content is also subject to the third-person perception: For example, the effects of electronic cigarette advertising are perceived to be stronger on others than on oneself (Pardun et al., 2017) and the perceived influence of H1N1 news on others was found to be greater than the perceived influence on oneself (Lee & Park, 2016). Third-person perceptions are generally stronger for undesirable content, and sometimes, but not always, even reversed for positive content (see, Perloff, 1999).

Undesirable media effects might relate to the contemporary challenge of the spread misinformation in media environments. Especially in complex and threatening situations like crises, the formation and spread of inaccurate information is often inevitable as a result of the heightened level of uncertainty combined with a high demand for information (Tan et al., 2015). WHO Director-General¹ Dr Tedros Adhanom Ghebreyesus went so far as to call the COVID-19 pandemic an “infodemic” in mid-February 2020. Such discourse about the prevalence of false and misleading information on the situation at hand may contribute to how the public perceives the severity of its impact. In light of better-than-average heuristic, a third-person perceptual gap might exist where people consider others more vulnerable to the undesired influence of misinformation. Indeed, extant research has documented third-person perceptions for the general influence of fake news (Jang & Kim, 2018)—i.e., individuals tend to believe that false information has greater effects on others than on themselves—and documented how exposure to fact-checking information that corrects fake news

¹<https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-ebola-and-covid-19-outbreaks>.

increased people's third-person perception (Chung & Kim, 2021). A recent study among Chinese respondents showed how individuals can have the tendency to perceive themselves as less vulnerable than others to the impact of digital disinformation regarding COVID-19 (Liu & Huang, 2020). Based on literature on the third-person perception, and evidence for a third-person perception in perceived vulnerability to false information in particular, we hypothesize that:

H2: Citizens perceive that they are less susceptible to the effects of mis- and disinformation about COVID-19 than others.

Media use and perceptions

Media information informs citizens' risk assessment, particularly in times of uncertainty and crisis (Beck, 1992; Boukes et al., 2019). Given the central role of the media in forming opinions, perceptions of the accuracy of media information, as well as overall levels of media use and information seeking, may play a crucial role in people's risk assessment. In general, the media provides citizens with knowledge and information about a given situation, which could increase optimistic bias and third-person perception (see, e.g., Wei & Lo, 2007). Because mass media mostly depict risk for the general public, individuals might dismiss those at risk as "not like me" (Cho et al., 2013; So, Wei et al., 2007). The lack of identification with the general public may thus result in reduced personal risk perceptions. Moreover, those who follow the news more closely may see themselves as more informed and therefore less susceptible to both the effects of misinformation and health risks. Thus, when people are more informed, they might feel overconfident and expect the risk to be lower for them. Yet, on the contrary, extensive experience with news consumption might help citizens understand that news media can portray risks in a general way and primarily on a societal level, which does not mean that individual risk should be underestimated.

Previous empirical evidence regarding media use on third-person perceptions is indeed mixed and the effects of media use are not consistent (see, e.g., Brosius & Engel, 1996; Rojas et al., 1996). In the specific context of health crisis situations, media use had no effect on third-person perceptions regarding news about the bird flu (Wei et al., 2007) or even decreased third-person perceptions (Wei et al., 2008). Media exposure also did not impact changes in optimistic bias regarding H1N1 (Cho et al., 2013). On the contrary, Wei et al. (2007) show that increased elaboration and attention to news about the bird flu increased third-person perceptions regarding the effect of such news on oneself and others. There is thus reason to expect different results for general media use and topic-specific information

seeking (with higher levels of elaboration). However, given this mixed pattern of evidence, we cannot formulate expectations about the direction of effects that media use and information seeking might have on optimistic bias and third-person perception. Therefore, we pose the following research question in the context of the COVID-19 outbreak:

RQ1: How are intentional news exposure about COVID-19 and general news consumption related to (a) optimistic bias about risk perceptions and (b) third-person perceptions regarding misinformation?

A second media-related variable that could impact biased optimism and third-person perception is the extent to which people believe that their media environment contains a high level of inaccurate, dishonest, or false information. If people are aware of the presence of misinformation, they might consider themselves less susceptible to its effects and the consequences of the overall outbreak due to being misinformed. At the same time, this awareness might cause citizens to think that the alarming amount of misinformation might result in misperceptions among others, which increase others' vulnerability over one's own susceptibility. Also, if individuals have the impression that a lot of information is incorrect or even intentionally deceptive, they might become unsure of what to believe. In turn, people might rely more on cues such as the representativeness heuristic or the better-than-average heuristic (Shepperd et al., 2002), instead of the information available, when forming their risk assessments. Moreover, most mainstream sources of information in the countries that we study emphasize that the COVID-19 pandemic's threat is severe, that most people are susceptible to the virus (even though to varying degrees), and that all citizens need to comply with strict interventions to combat the crisis. If people believe that such information is misleading or incorrect, they may counter-argue the dominant media interpretation that *everyone* is at risk, and consequently perceived their own risk to be relatively lower. We therefore ask:

RQ2: Are higher misinformation perceptions about COVID-19 related to (a) optimistic bias about risk perceptions and (b) third-person perceptions regarding misinformation?

Method

To understand whether people hold optimistic beliefs and third-person perceptions during societal disruptions or crises, we rely on the COVID-19 pandemic as a case study. In many countries, people have had to modify

their everyday lives in order to slow the spread of COVID-19. Early on, health experts recommended increased hygiene standards and substantially reduced social contact. Later on, when the virus spread more rapidly, strict lock-down interventions were enforced in many different countries—which aimed to *flatten the curve* of the rate of infections by proposing strict measures that limited social contact. However, not all governments implemented these measures to the same extent, and not all citizens embraced them equally. Since such risk-taking behavior (i.e., lack of compliance with measures) might be related to biased perceptions regarding one's susceptibility on the individual level, the pandemic provides a valuable context to explore optimistic bias and third person-perception and how they relate to the contemporary media environment characterized by an abundance of media choices and the omnipresence of false information.

We rely on survey data collected in the USA, the UK, the Netherlands, and Germany. The data were collected on March 19, 2020, in the early phase of the pandemic when (accurate) risk perceptions are considered crucial. Fieldwork was closed within one day after the launch to minimize the impact of real-world developments (e.g., announcement of new public-health guidelines or increase in number of people hospitalized) on our data. In all four countries, there was a high level of uncertainty concerning the spread of the virus and which measures governments would implement. Some measures were already in place in all countries, but often varied by state or region. This includes, for example, closures of schools, daycare centers, and some public places, travel restrictions, and cancellation of large events. Yet, the number of infections and casualties was not as high as in more severely hit countries, such as Italy or Spain (reported deaths: USA = 174; UK = 144; NLD = 76; GER = 20, reported infections: USA = 12,018; UK = 3,269; NLD = 2,460; GER = 10,999). The design of this study was approved by the Ethics Review Board of the University of Amsterdam, Amsterdam School of Communication Research in March 2020.

Sample

We relied on the services of an international research company (Dynata) for data collection. Dynata relies on mixed databases of the sampling of respondents (i.e., developed by partner companies). Using voluntary opt-in lists, this sampling company invites respondents via e-mail and rewards them with a credit system. In total, 1,912 respondents participated in the survey: 400 respondents from the USA, 572 from the UK, 426 from the Netherlands, and 514 from Germany. The average age was 48.84 ($SD = 14.35$) in the USA, 45.77 ($SD = 12.59$) in the UK, 42.21 ($SD = 13.67$) in the Netherlands, and 44.27 ($SD = 13.69$) in Germany. In

terms of gender, the distribution looks as follows: female: 70.27%, male: 28.72% non-binary: 1.01% in the USA; female: 52.98%, male: 46.84% non-binary: .18% in the UK; female: 53.99%, male: 46.01% non-binary: 0% in the Netherlands; female: 49.13%, male: 50.68% non-binary: .19% in Germany. Regarding education, the distribution per country was: low: 18.60%, medium: 54.52%, and high: 26.88% in the USA; low: 17.20%, medium: 45.96%, and high: 36.84% in the UK; low: 15.02%, medium: 38.50%, and high: 46.48% in the Netherlands; low: 36.19%, medium: 36.38%, and high: 27.43% in Germany. In the middle of the survey we included an attention check, those who failed this check received a warning message asking them to read the questions more carefully.

Dependent variables

Optimistic bias related to risk perceptions

We rely on a commonly used approach to measure comparative optimistic beliefs (Shepperd et al., 2013). Participants were asked to rate the likelihood of being affected by three risk elements related to COVID-19 for themselves and others on a scale ranging from 0 to 100. First, we asked how likely they think it is that they themselves/others will get infected by the coronavirus, mean difference between others and self (perceived risk level for themselves minus the level for others): 13.20; $SD = 20.73$. Second, respondents were asked to rate, if they/other people get the coronavirus, how likely they think it is that they/other people will get seriously ill, mean difference between others and self: 4.69, $SD = 21.43$. Third, participants responded to how likely, as a result of the coronavirus outbreak, they think that they/other people would suffer serious financial consequences, mean difference between others and self: 23.01, $SD = 29.47$. The difference between the estimated risks for oneself and others measured the degree of biased optimism. Respondents who had earlier reported that they tested positive for COVID-19 or were certain they had this virus were not asked these questions. For the analyses in which we focus on general optimistic bias, we use the mean difference between the risk perceptions for others and self of all three elements ($M = 10.24$, $SD = 11.99$; Cronbach's $\alpha = .78$).

Third-person perception of misinformation

Next, we aimed to measure whether people hold third-person perceptions regarding the extent to which they and others are influenced by misinformation on the coronavirus. We mentioned to respondents that in times like the COVID-19 outbreak, inaccurate information or fake news can be spread. On a scale from 0 to 100, they were asked how much the exposure to fake news about the coronavirus would affect them and other people

(Jang & Kim, 2018), mean difference between others and self: 22.13; $SD = 25.10$.

Independent variables

General media use

We asked respondents to indicate how many days a week they follow the *news* during a normal week through the following sources:— a paid newspaper (printed or digital version) and their website or app, TV news programs and their website or app, other online news websites and apps, and news via online social-media platforms. We took the mean of the scores on all sources to measure general media use ($M = 3.45$; $SD = 1.47$; Cronbach's $\alpha = .84$). These questions were asked in the beginning of the survey, before the topic of COVID-19 was introduced. This flow ensures that the answers are about general news consumption and not related to their news consumption regarding COVID-19, which was measured with the variable information seeking.

Information seeking

To measure if people intentionally exposed themselves to information about COVID-19, respondents were asked to indicate their agreement with one item on a 7-point Likert scale: "I actively seek out news on the coronavirus regularly because I think it is important" ($M = 4.97$, $SD = 1.79$; Van den Bulck, 2006).

Misinformation perception

To document respondents' perception on the presence of misinformation about COVID-19, we included four items related to both the intentional and unintentional dissemination of inaccurate information (inspired by measures from Hameleers et al., 2021), which can be related to the distinction between misinformation and disinformation. However, for the purpose of this study, we do not analyze perceptions of mis- and disinformation separately, but rather use the mean score on all four items as a single measurement. Empirically, it can also be noted that the items indicating misinformation beliefs correlate strongly with the items used to measure disinformation ($r < .80$), which further underlines the overlap between beliefs related to mis- versus disinformation: News users tend to perceive the inaccuracy and dishonesty of information as interrelated, and do not consistently distinguish between honest mistakes and deliberate deception. The items specifically asked if respondents agreed that (on a 7-point Likert scale) there is a lot of (1) inaccurate information about the corona virus, (2) deceptive and misleading information, (3) intentionally spread false information, and (4) false information spread because of lack of knowledge about the corona virus ($M = 4.71$, $SD = 1.27$, Cronbach's $\alpha = .81$).

Control variables

Several central control variables were added in an attempt to avoid reporting spurious correlations among factors (see Appendix 1 for justification). *Trust in other people* was measured in the beginning of the survey, before the COVID-19 context was specified: respondents were asked one item, on a 7-point Likert scale: "In general, most people can be trusted" ($M = 3.85$; $SD = 1.01$). *Indirect risk experience* was measured by asking respondents whether they personally knew other people who have been infected (11.11% said they knew someone affected). To control for *income affected* we asked respondents to indicate the percentage of their monthly income they expect to lose if they would not be able to go to work because of the coronavirus outbreak ($M = 27.46$, $SD = 32.88$).

Results

First, we tested the main hypotheses on the existence of optimistically biased risk perceptions. H1 stated that people estimate that it is less likely that they, compared to others, (H1a) get infected, (H1b) become seriously ill when getting infected, and (H1c) suffer financial consequences. In the overall sample, respondents think that they are less likely to become infected with COVID-19 ($M_{1st} = 40.08$, $SD = 25.79$, $M_{3rd} = 53.28$, $SD = 24.67$, $t = -26.5$, $p < .001$), less likely to become seriously ill if they contract it ($M_{1st} = 40.39$, $SD = 26.49$, $M_{3rd} = 45.08$, $SD = 22.85$, $t = -9.1$, $p < .001$), and less likely to suffer financial consequences ($M_{1st} = 41.06$, $SD = 32.63$, $M_{3rd} = 64.06$, $SD = 24.59$, $t = -34.1$, $p < .001$) than others. These results offer consistent support for H1: Respondents display biased optimism regarding the risks of COVID-19. H2, which stated that there would be a third person perception regarding misinformation, is also supported: Respondents think they are less likely than others to be influenced by misinformation ($M_{1st} = 33.06$, $SD = 28.33$, $M_{3rd} = 55.18$, $SD = 25.29$, $t = -38.412$, $p < .001$). All t-values are based on paired-sample t-tests. Figure 1 illustrates that the perceived self-other differences tested for H1 and H2 are consistent across all four countries. In Table 1, where countries are used as control variables, it can be observed that there are some cross-country differences regarding level of optimistic bias and third person perception. The optimistic bias is found to be substantially higher in Germany compared to the other countries, and the third person perceptions is relatively lower in the US and UK. Appendix 2 details the mean scores across countries for both independent variables.

To answer RQ1 and RQ2, we ran OLS regression analyses with the two different forms of biased perceptions of self-other asymmetry: (1) optimistic

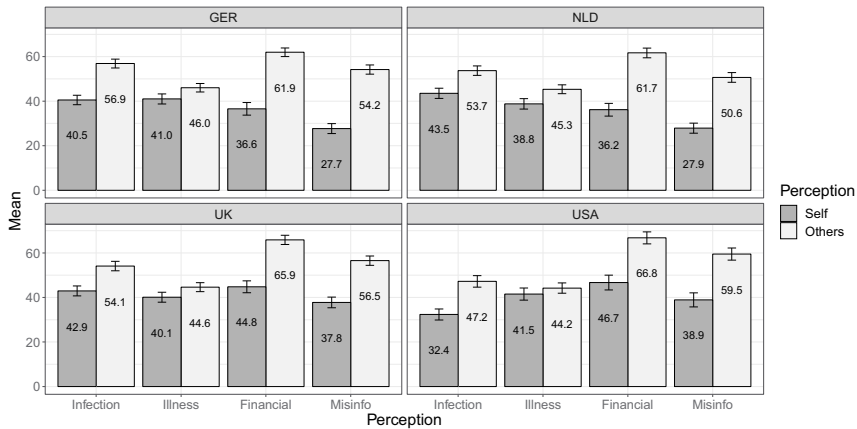


Figure 1. Mean scores of risk perceptions for self and others regarding getting infected, becoming seriously ill, being financially affected, and being influenced by misinformation.

bias regarding risk perception and (2) third-person perception regarding misinformation. RQ1 asked how intentional news exposure about COVID-19 and general news consumption relate to these two phenomena. First, based on the estimates provided in Table 1, actively seeking information about COVID-19 is associated with higher optimistic bias regarding risk perception, but not with third-person perception. There is a negative association with general media use; those who follow the news more frequently are found to hold less optimistic beliefs regarding personal risk and third person perception. Chi-squared tests show that the effect of general media use is especially prominent for the third-person perception. To answer RQ1, general media use is found to be related to lower optimistic bias and third-person perceptions, while seeking information specially about COVID-19 was related to higher optimistic biases regarding risk perception, but not third-person perceptions.

RQ2 asked how perceptions of misinformation about COVID-19 relate to biased perceptions of self-other asymmetry. Table 1 shows that these perceptions are significantly associated with higher optimistic bias regarding risk perception and third person perception about the effect of misinformation. This observed association with misinformation perceptions is the strongest for third-person perception.

Additional analyses were conducted to consider each nation separately. As shown in Table A1 of the online supplemental appendix shows, the relationship between intentional news seeking and optimistic bias is driven by the findings from Germany. Even though there is a positive relationship between the two variables for all countries in the sample, they are not

Table 1. Regression analyses relating optimistic bias and third-person perception to media use and perceptions.

	Optimistic bias risk perception	Third person perception
Information seeking	0.58*** (0.16) ^a	0.29 (0.33) ^c
General media use	-0.52* (0.22) ^a	-2.32*** (0.43) ^c
Misinformation perception	0.39 [†] (0.22) ^a	5.09*** (0.45) ^b
Trust in others	-0.52 [†] (0.28)	-0.75 (0.56)
Indirect experience	0.65 (1.00)	0.15 (1.82)
Income affected	-0.13*** (0.01)	-0.11*** (0.02)
Political ideology (left-winged)	-0.04 (0.12)	-0.89*** (0.25)
Gender	-1.82** (0.56)	0.78 (1.13)
Age	-0.12*** (0.02)	0.12** (0.04)
Education	0.30 (0.38)	1.16 (0.77)
USA ^a	1.06 (0.88)	-3.24 [†] (1.76)
UK ^a	0.57 (0.79)	-4.93** (1.57)
Germany ^a	2.05* (0.81)	2.66 (1.63)
Constant	17.08*** (2.44)	9.05 [†] (4.76)

Cells contain unstandardized regression coefficients, standard errors in parentheses.

[†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

^aReference category: The Netherlands Means with differing subscripts within rows differ significantly at the $p < .05$ level based on post-hoc estimation Chi-Squared tests.

Excluding control variables from the models provided comparable results regarding the association between optimistic bias and third-person perception to media use and perceptions.

statistically significant. Moreover, while in the full model (Table 1), general media use is negatively associated with both optimistic bias and third person perception, this pattern is more mixed in the county-specific models. As shown in Table A2 in the supplemental appendix, the significant negative relationship between media use and optimistic bias is only present in the UK. Likewise, the positive association between misinformation perception and optimistic risk beliefs was only found for the US and UK. For the dependent variable third person perception (see Table A2.2 in the supplemental appendix), the negative relationship between media use and third person perceptions is significant in the US, UK, and Germany. Furthermore, just like in the full model, the relationship between misinformation perceptions and third person perceptions is positive and significant in all four countries.

Discussion

Citizens are assumed to be biased in their estimates of risk—which can have huge ramifications for deliberative democracy and participation. Hence, if citizens believe that global threats like the COVID-19 outbreak do not affect them personally, they may be less likely to comply with health regulations communicated by the authorities. Media use and perceptions may be important antecedents of these biased estimates—especially in times of high uncertainty and a post-factual information ecology where factual evidence is constantly doubted and de-legitimized. In this study, we found that individuals in four countries (US, UK, Netherlands, and Germany) share distorted self-other asymmetry beliefs during times of crisis, more specifically, in the context of the COVID-19 outbreak. When comparing themselves to others, people estimate their personal health and financial risks as well as the influence of misinformation to be lower for themselves.

These findings are in line with theorizing on optimistic bias; i.e., the human tendency to believe that others are more likely to experience undesirable outcomes, and less likely to experience desirable outcomes than oneself (Weinstein, 1980). Our findings offer consistent support for optimistic biases regarding risk perceptions across different domains: People think they are less likely to become infected with COVID-19, get seriously ill, and suffer financial consequences. However, estimating to be personally less at risk of becoming infected compared to others, may have problematic consequences for actual (pro-social) behavioral change along the lines of compliance with public health measures. For example, Wei et al. (2007) demonstrate that personal risk assessments, but not perceived risks for others, can be conducive to preventative action. Although we do not directly focus on behavioral consequences in this paper—as people generally show a (memory or desirability) bias in accurately reporting behaviors—our findings may have real-life implications for behaviors. Citizens who do not perceive themselves as vulnerable may actually demonstrate less willingness to adapt their behaviors in line with the interventions recommended by the authorities.

Our findings point to some interesting cross-national differences. Compared to the Netherlands, participants in Germany demonstrated stronger optimistic biases related to their risk assessments. Although the severity of the health crisis was quite similar across these settings, German participants may have had more distrust in other people's compliance and more self-confidence and efficacy beliefs in how to handle the crisis than Dutch participants—who perceived a smaller gap between the self and others. Differences in governmental policies and communication may explain these different perceptual gaps: Clearer communication and stricter

policies at the time of data collection in Germany may have strengthened optimistic biases, whereas the rather *loose* regulations in place in the Dutch setting may have lowered the gap between assessments of the self versus others: As there were no clear expectations or norms on how to behave, all people may be equally capable of adjusting their behaviors. We also see that the third-person perception of misinformation is lower in the UK compared to the Netherlands. We may explain this regional difference based on strong differences in news trust across countries, as illustrated by the Reuters Digital News Report of 2020 (Newman et al., 2020): 52% of Dutch citizens trusted the news most of the time, whereas trust was considerably lower in the UK (28%). Similarly, Dutch citizens were much less concerned about misinformation than citizens in the more polarized setting of the UK. As distrust and concerns about misinformation were much more salient in the UK than the Netherlands, the perceptual gap between effects on the self versus others may be considerably lower than in the Dutch setting—where the belief that misinformation would not affect individuals was more plausible considering higher levels of trust overall. Given the omnipresence of misinformation during crisis situations (Tan et al., 2015), we also explored third-person perceptions related to false information in people's information settings. In line with previous research about third-person perceptions regarding misinformation (Jang & Kim, 2018), our results show that individuals tend to believe that misinformation about COVID-19 impacts others more than it impacts themselves. This biased perception could possibly make them less concerned about the impact of false information they might receive. In the context of high uncertainty and expert disagreement, however, it may be particularly important for citizens to critically navigate their information environment, verify sources, and triangulate information. Yet, these implications remain speculative. More research is needed regarding the effects of third-person perceptions related to misinformation, and how they may impact information processing and media literacy. In a next step, we explored the influence of media use and perceptions on biased beliefs. We found that higher general media use corresponds to lower optimistic bias (in the UK) and third-person perception (UK, US, and Germany), while issue-specific information seeking (about COVID-19) actually corresponds to more pronounced optimistic biases regarding risk perceptions in some contexts—in our sample, specifically in Germany. These findings seem to indicate that higher levels of general media exposure, at times, can bridge the perceptual gap between personal and societal risks: When individuals generally consume more news, they arguably might hold higher levels of news media literacy, and therefore may be better able to interpret and generalize media information about risks for the general public and the potential influence of inaccurate information. In particular, they may better understand implications of these

general, societal risks for their own, personal risk. On the contrary, the association with specific information seeking can follow an opposite pattern: In some contexts, stronger optimistic biases can be found among those who intentionally seek out news about COVID-19. These individuals might feel relatively better informed as well as more knowledgeable and therefore less susceptible to risks compared to others. Confirmation-biased selective exposure (e.g., Stroud, 2008), rooted in cognitive dissonance (Festinger, 1957), might offer an explanation. In order to avoid the discomfort of discrepant information, people that intentionally look for corona-related information may selectively expose themselves to news that demonstrates that the virus mainly affects other people.

Furthermore, we found that higher beliefs regarding the omnipresence of misinformation are associated with stronger self-other asymmetry perceptions regarding risk assessment (in the US and UK) and the effect of misinformation (all countries). Thus, perceptions that false information is being spread regarding the outbreak may relate to the idea that others, who are allegedly unaware of the presence of misinformation, are more vulnerable to risks. Overall, despite country difference, these findings could suggest that the way people perceive the information environment around them in terms of its accuracy relates to their personal risk assessment and assumed media influences. When they perceive that the spread of inaccurate information is a sincere problem, they might assume this has stronger effects on other people, in the sense that these other people might be more at risk and less knowledgeable about how to understand the situation at hand because of potential misperceptions about the outbreak caused by the spread of misinformation.

The patterns regarding the relation between optimistic bias and third person perception with media use and misinformation perceptions were not fully consistent across all countries and should therefore be interpreted with caution as they may only apply in some contexts. Future research could examine the reasons for these different patterns in different country contexts—they could be due to differences in media and political systems.

Taken together, our findings provide new insights into how media use and perceptions can matter for people's assessment of their own risk in comparison to others—they may use the media's information to update their beliefs about their susceptibility and compare their own receptiveness to others. In times of crisis, people are not only affected by media reporting per se, but also by their perceptions of the accuracy of information available. As an important theoretical contribution to third-person effects literature, our study situates biased risk beliefs in the current high-choice and fragmented media ecology characterized by increasing relativism toward factual knowledge and the uncontrolled spread of misinformation (Van Aelst et al., 2017). In times when misinformation perceptions are prevalent and even found to impede

pro-social behaviors (Hameleers et al., 2021), it is important to assess the impact of such beliefs on biases and misperceptions. Based on our findings, we conclude that beliefs related to the untruthfulness of incoming information in times of high uncertainty and information overload may play a central role in how people assess personal risks related to others. Beliefs related to a misinformed information ecology may cultivate misperceptions related to risk assessments, which makes informational factors crucial to consider in third person effects literature (also see, Jang & Kim, 2018).

This study is not without limitations. First, we rely on self-reported cross-sectional data, which has ramifications for the causal inferences we draw. Media use may affect optimistic biases, but the causal direction could also be reversed or reciprocal: The fewer people feel at risk compared to others, the more they may avoid general media, and selectively expose themselves to congruent information that downplays their personal risks. Our data also do not allow for making inferences about the consequences of optimism bias. Future studies could relate biased perception to measures of actual behavior (such as compliance with governmental measures). Preferably, such studies find a way to measure actual behavior rather than self-reported behavior since self-reported measures are strongly susceptible to socially desirable responses. The social desirability of behavior like compliance with public-health measures can result in people who hold optimistic bias regarding their risk not only to report underestimating undesirable risks but also overestimating desirable behaviors when engaging in comparative assessment. The self-reported measure of behavioral intentions might therefore provide skewed and invalid scores in the context of studying optimistic bias and third-person perception. Moreover, third-person perception, measured with self-other difference scores, can be inadequate for capturing overconfidence because it conflates both real self-other differences and actual bias (Shen et al., 2018). Ideally, a behavioral baseline would be relied on to measure overconfidence and detect biases. Hence, our measures might reflect a great deal of earned confidence and should therefore be interpreted with caution. Despite these limitations, our study offers novel insights into how people perceive their own vulnerability compared to others in times of a global health crisis, and the role of media information in this process. Applied to a context of factual relativism and omnipresent on misinformation in society (e.g., Hameleers et al., 2021; Kleis Nielsen et al., 2020), we reveal how the perceptual gap between the self and others is relevant to consider in times when misinformation is salient as both a label and informational genre (Egelhofer & Lecheler, 2019).

Because biased beliefs, like optimistic bias and third-person perception, are not a result of conscious effort, making people aware of these beliefs in their comparative risk assessment might be a first step (McKenna & Lewis, 1991). Although numerous previous studies have suggested that it is difficult to

eliminate optimistic bias, some factors can be helpful in closing the perceptual gap between the individual and other people. First, optimistic bias is reduced when the comparison group becomes closer to the individual (Perloff & Fetzer, 1986). Hence, communicators can try to make the risk of COVID-19 more personally relevant by ensuring the comparison group is closer to the individual instead of reporting on generic “others” as this can elicit gaps. Second, more direct experience with an event or risk can lead to reducing the optimistic bias (Helweg-Larsen & Shepperd, 2001). The use of human-interest stories of those affected by COVID-19 might serve as a para-social experience of the consequences which might make the personal risk more evident. In the end, it is important to understand that biased self-other asymmetry perceptions can play a critical role in how people assess personal risk during large-scale crises such as the COVID-19 outbreak and that the way people use media and how they perceive the accuracy of information can relate to the formation of such distorted beliefs.

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