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Do media objectivity and frequency of informing mediate the relationship between traditionalist social attitudes and COVID-19 conspiracy beliefs?

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ABSTRACT

In this study, we hypothesized that traditionalist social attitudes (conservatism, religiousness, and authoritarianism) significantly predict COVID-19 conspiracy beliefs (Hiding Information and Harmless Virus), as well as conspiracy mentality in general. We also hypothesized that these relationships are mediated by the objectivity of the media through which individuals inform themselves, and the frequency with which people informed themselves about the pandemic. The sample consisted of 341 participants from Serbia (mean age 33.51 years), of which 40.5% were women. The results revealed that conservatism predicts both conspiracy belief sets and conspiracy mentality, authoritarianism only COVID-19 conspiracy beliefs, and religiousness only beliefs that the virus is harmless. Media objectivity does not mediate these relationships. The frequency of informing is a significant mediator only of the relationships between authoritarianism, and conspiracy beliefs and conspiracy mentality, indicating that the role of seeking information is in reducing the threat perceived by more authoritarian individuals. The study reveals that media objectivity might not play a role in reducing conspiracy beliefs. An explanation might be found in the importance of the perceived credibility of the media.

The importance of different aspects of media reporting has increased during the COVID-19 pandemic. The so-called infodemic – "the overabundance of information and the rapid spread of misleading or fabricated news, images, and videos" (World health Organization [WHO], 2020a) – that "makes it hard for people to find trustworthy sources and reliable guidance when they need it" (WHO, 2020b) has accompanied this world event since the very beginning (Bridgman et al., 2020). The effects of the media coverage of a disease can be reflected in changes in virus transmission patterns. For example, an increased volume of media coverage of influenza was related to a decrease in the median number of infections (Kim et al., 2019), contributing to the scale and the consequences of the pandemic. During the COVID-19 pandemic, the emergence and dissemination of fake news has increased (Apuke & Omar, 2021), and COVID-specific conspiracy theories have flourished (Stein et al., 2021).

Conspiracy beliefs are, at least partly, in service of satisfying the social-psychological motives of understanding one's environment, having a feeling of security and control, and maintaining a positive self-image (Douglas et al., 2017; Swami & Furnham, 2014). It is no surprise that they flourish in a societal crisis such as a pandemic (Van Prooijen & Douglas, 2017). A growing body of research indicates that conspiracy beliefs are negatively correlated with protective health behaviors (e.g., Bierwiaczonek et al., 2020; Karić & Međedović, 2021) and support for public health policies (e.g., Earnshaw et al., 2019). The purpose of the study is to explore how social attitudes are related to conspiracy beliefs and whether behaviors of searching for information about COVID-19 mediate these relationships.

Traditionalist social attitudes and conspiracy beliefs

The so-called traditionalist social attitudes (Ludeke et al., 2013; Saucier, 2000) – social conservatism, authoritarianism, and religiousness – have been related to one another (e.g., Feldman & Johnston, 2014), and to conspiracy beliefs in a number of studies. For example, social conservatism correlates positively both with general conspiratorial ways of thinking, and with specific conspiracy beliefs (e.g., climate change; Van der Linden et al., 2021), which is expected, since it has been demonstrated that people believe different, even opposing, conspiracy beliefs at the same time, indicating the existence of a single superordinate factor (Wood et al., 2012). Negative correlations between liberalism and conspiracy beliefs were found by Hart and Graether (2018). However, it is also argued that conspiracy beliefs cannot be limited to only one side of the ideological spectrum (Oliver & Wood, 2014).

Authoritarianism has also been related to conspiracy beliefs (Goldberg & Richey, 2020; Swami, 2012). This relationship might be explained by their mutual elements: believing in conspiracy theories includes beliefs that (secret) powerful groups are plotting against humanity, and they often involve governments (Van Prooijen, 2018). Individuals high in authoritarianism tend to blame outgroups for their problems and disadvantaged positions, and this is exactly the explanation provided by Abalakina-Paap et al. (1999) for the relationship between the two phenomena. In a recent study by Alper et al. (2020), right-wing ideology was positively related to conspiracy beliefs related specifically to COVID-19.

Regarding religiousness, it is again argued that religious and conspiracy beliefs share certain elements, e.g., prophecy and paranormal activity (Robertson & Dyrendal, 2018), although studies have yielded different results. Hart and Graether (2018) found that religious believers hold more conspiracy beliefs, a finding contrary to that of Jasinskaja-Lahti and Jetten (2019), who claim that higher religious attachment, rather than self-categorization as believer or nonbeliever, is related to more beliefs in conspiracy theories. However, in Hart and Graether's study, religiousness had a low correlation with conspiracy beliefs, and was not a significant predictor. Religiosity, as well as authoritarianism, were found to predict conspiracy beliefs in a recent study by S. Kim and Kim (2021), and in a study by Galliford and Furnham (2017), who found religiousness to be a predictor of political and medical conspiracy beliefs.

Conspiracy beliefs and the media

The presence of misinformation and fake news can be related to conspiracy beliefs. Given that a pandemic can be considered a societal crisis, with its important social, economic and many other consequences, and a rather novel situation to most of the population, people seek information to understand it. Therefore, they tend to rely on media for an understanding of the events (M. Kim & Cao, 2016). A media environment that contains misinformation can lead to higher endorsement of conspiracy beliefs (M. Kim & Cao, 2016), as well as to changes in attitudes and behaviors (Bridgman et al., 2020). Pennycook et al. (2020) emphasize that misinformation present in the media during a pandemic could turn people toward ineffective remedies, overreacting (e.g., hoarding behaviors) or underreacting (e.g., not adhering to containment measures). A number of studies have found a relationship between conspiracy beliefs and a lack of adherence to protective behaviors (e.g., Bierwiaczonek et al., 2020). One of the mechanisms for attitude and behavior changes could be the truth effect – repeated exposure leads to a stronger belief, regardless of whether the information an individual is exposed to is true or false (Dechêne et al., 2010). The majority of studies in the field of social psychology focusing on COVID-19 conspiracy beliefs and media have included exposure to social media, since conspiracy theories spread mostly through them (Stempel et al., 2007). Indeed, it was found that more social media exposure or using social media as a source of information about the pandemic is related to more COVID-19 misperceptions (Allington et al., 2020; Bridgman et al., 2020). Some studies have involved "traditional" media (TV, radio, newspapers) exposure and found that more exposure to these types of media is related to lower conspiracy beliefs (Allington et al., 2020; Bridgman et al., 2020). However, a study by Mancosu and Vegetti (2020) revealed that the media

source (mainstream vs. alternative) is not related to news plausibility evaluation for people with low conspiracy mentality. However, in individuals with high conspiracy mentality, conspiratorial news is evaluated as more plausible when it comes from an alternative news source rather than mainstream media. As the authors explain, this is a situation in which people are "exposed to a combination that strongly resonates with their previous experiences" (i.e. a conspiracy story published by an independent source; Mancosu & Vegetti, 2020, p. 11).

Both the quantity and quality of information individuals are exposed to are related to conspiracy beliefs, although only a small number of studies has dealt with the matter. Swami et al. (2010) found that more exposure to 9/11 conspiracy theories is related to adopting more conspiracy beliefs. Also, S. Kim and Kim (2021) found a positive correlation between the quantity of information and conspiracy beliefs. When it comes to quality of information, different aspects can be observed. For example, if the information is more elaborate, it decreases conspiracy beliefs, and the higher the quality of information, the lower the conspiracy beliefs (S. Kim & Kim, 2021). Additionally, if policies are well understood, there is a higher tendency to comply with them (Porumbescu et al., 2017). Trust in media sources is also found to be important for the adoption of protective behaviors. In their study, Zhao et al. (2020) found that people who had more trust in the right-leaning vs. the left-leaning media engaged in riskier and fewer containment-related behaviors.

Research context

In Serbia, the COVID-19 epidemic was declared on 15th March 2020, and two days later, a state of emergency was introduced, followed by a number of measures including curfews, reduced movement, the closure of hospitality services, etc. A crisis communication analysis (Kešetović, 2020) showed that the communication by officials during the COVID-19 crisis was politicized, inconsistent, incomplete, and irresponsible, and included spreading false information and minimizing risk. Kešetović also describes examples of tabloidization of the crisis (e.g., participation of the Crisis Staff experts in debate shows, including TV channels that are marked as tabloids, which undermined their credibility) and attacks on both journalists and the freedom of the media, as well as discrimination of independent journalists at press conferences. A discourse analysis of media framing throughout the pandemic in Serbia indicates that there were two dominant frames during the state of emergency, in which our data were collected: the health care frame (the promotion of health care measures, denying health risks, underestimating prevention, panic relief strategy, spreading anxiety) and the political instrumentalization frame (the pandemic used as a platform for political campaign, self-promotion (of the president) and promotion strategies (of other political actors), framing the virus as a matter of state survival; Milutinović, 2021). This study included a wide range of editorial orientations, including particularly pro-regime and pro-opposition media, and revealed that the pro-regime media were heavily influenced by the political narratives of the President. Additionally, in the report of the European Commission for 2020, it is emphasized that the transparency of media ownership and allocation of funds remain an issue in Serbia, followed by the lack of counterbalance to government policy and diversity of political views (i.e. only pro-regime policies and political views are presented), and intimidation and violence against journalists (European Commission, 2020).

The present study

In this study, the aim was to explore whether the three traditionalist social attitudes (authoritarianism, religiousness, and conservatism) predict conspiracy beliefs specifically related to the COVID-19 pandemic, as well as conspiracy mentality in general. We also wanted to test whether the frequency of informing oneself about the pandemic and the objectivity of media sources mediate these relationships. Based on previously described findings, the following hypotheses are proposed:

H1. Authoritarianism (H1a), religiousness (H1b) and social conservatism (H1c) positively predict conspiracy beliefs and conspiracy mentality.

H2. The objectivity of the media mediates these relationships, such that more traditionalist attitudes predict following less objective media, which in turn predicts higher conspiracy beliefs and conspiracy mentality.

H3. The frequency of informing mediates the relationships between traditionalist social attitudes and conspiracy belief variables, such that more traditionalist attitudes predict more frequent informing, which in turn predicts lower conspiracy beliefs and conspiracy mentality. We hypothesize that individuals who tend to inform themselves more frequently, as an adaptive reaction to the novel crisis, would believe less in conspiracy theories, as they will have higher levels of information.

Method

Participants

A power analysis was conducted in the R package *pwr*, the minimum correlation was set to 0.20 (given the foreseen limitations in sample size, i.e. data collection limitations, and our decision to detect even small but meaningful effect sizes), alpha at 0.05, and power at 0.95, and arctangh transformation was applied. The result indicated that a sample of 318 participants would be sufficient to reach the desired effect. The sample consisted of 341 people from Serbia, of which 40.5% were women. The mean age of the sample was M = 33.51 years (age range 18–71). A quarter of the sample had a high-school diploma (25%), 36.2% had a bachelor's degree, and 38.8% had a master's degree or higher. The majority (70.7%) lived in cities with more than 100,000 habitants, 19.4% in towns with between 10,000 and 100,000 habitants, and the rest (10%) in smaller villages (less than 10,000 habitants).

Materials

See, Table 1 for the reliability of each measure. The data and materials used in this study are available at https://doi.org/10.17605/OSF.IO/N5X8T.

Authoritarianism was measured by the UPA-S scale (in Serbian, Upitnik autoritarnosti – skraćena verzija, i.e., Authoritarianism questionnaire – short; Mihić et al., 2010), a scale designed for and validated in the Serbian language. It measures three dimensions of authoritarianism: aggressiveness (e.g., I despise people who cry in public), submissiveness (e.g., You will never be wrong if you do what your boss tells you) and stoicism (e.g., Life is a constant struggle). The average score on all 15 items was used for this study. The response scale ranged from 1 (completely disagree) to 5 (completely agree).

Social conservatism was measured by an adapted Scale of Social Conservatism developed by Everett (2013). Five items of this scale were administered: support for abortion (reverse coded), traditional marriage, traditional family, patriotism, and religion. The response scale ranged from 1 (do not support at all) to 5 (support completely), and the score was calculated as the mean of all items. The scale has already been used many times in Serbian language.

Religiousness was measured by a single item: How religious are you? The answers ranged from 1 (not at all) to 5 (very religious).

The frequency of informing was measured by a scale including six types of sources on information about COVID-19: television, internet, social media, other people, newspapers, covid19.rs (official portal of the government for information about the pandemic). The question was how often participants informed themselves using these sources, and the scale ranged from 1 (never) to 5 (always). Although some previous studies found differences regarding informing from different media sources,

we have not identified such differences related to our dependent variables. Additionally, only one factor of the general frequency of informing was isolated (Eigenvalue = 2.18; Promax rotation, explaining 36% of the variance). Factor loadings are provided in Supplementary materials.

The objectivity of media sources. In the survey, participants were asked with an open-ended question to provide information about the sources from which they inform themselves about the pandemic. A list of 38 media sources was collected and sent to three independent media experts for assessing the objectivity of each source, on a scale of 1 (not objective at all) to 5 (completely objective). Only media sources whose objectivity was graded by at least two of the three experts were included (raters were not familiar with some media sources occurring once or twice in the sample; these were excluded). We considered that including at least two grades increases the validity of the assessment (only two sources had two grades). The final list included 32 sources (see Supplementary materials). The absolute-agreement, 2-way mixed-effects model of the intraclass correlation was applied, and the obtained ICC indicated moderate to good reliability (ICC = 0.82, 95%CI = 0.70–0.91). The media source objectivity for each participant was calculated as the mean score of the scores of all media sources they reported to gain information about the pandemic from.

The COVID-19 Conspiracy Belief Scale was created for the purpose of this study. It included nine conspiracy beliefs most present in the Serbian social media space at the beginning of March, when the first case was registered. The scale consisted of two subscales: the Harmless Virus, which included items referring to beliefs that the virus is harmless, does not exist or is a hoax, and Hiding Information, which included items not denying the existence of the virus, but emphasizing that the real information is being hidden or distorted (for details on factor structure see, Karić & Međedović, 2021). The response scale ranged from 1 (completely disagree) to 5 (completely agree).

The Conspiracy Mentality Questionnaire (CMQ; Bruder et al., 2013) consisted of five items measuring general tendency to hold conspiracy beliefs (e.g., I think that government agencies closely monitor all citizens). The response scale ranged from 1 (completely disagree) to 5 (completely agree), and the mean score was used in the analyses. The Serbian translation is available in Petrović et al. (2019) and the scale has been used in other studies on Serbian samples (see e.g., Adam-Troian et al., 2021; Imhoff et al., 2022).

Procedure

The data were collected online during the state of emergency (17 April – 5 May 2020) in Serbia, via the Google Forms platform. The participants provided informed consent to take part in the study, and the data was collected anonymously. The purpose of the study presented to the participants was to explore their perceptions of the coronavirus and the current pandemic in Serbia. The survey was distributed via social media, applying the snowball method. The initial dataset contained 446 cases (this is a part of a larger study that included more variables, not relevant to this paper). For the purpose of this article, 100 cases were removed: those who did not respond to the question about the media source, or responded without specifying the source (e.g., "everywhere"), or stated social networks as sources (e.g., Facebook, Reddit, Twitter; these were removed because they do not provide a specific media source), or named scientific articles as sources, or YouTube videos. Then, the variables were normalized and after checking that the data were missing completely at random and not systematically related to observations or variables in the study (Little & Rubin, 2019), the missing values were replaced by means. Five outliers were excluded by calculating the Mahalanobis distance, leaving a final sample of 341 cases. For testing relationships among the variables, Pearson's correlation coefficient was calculated. A set of multiple regressions was applied before testing the mediation model. These were performed in IBM SPSS 23.0. The path analysis model was modeled in IBM SPSS AMOS 23.0.

Table 1. Descriptive and reliability statistics for the variables in the study.

Variable	M	SD	Cronbach's α	Skewness (S.E. = .13)	Kurtosis (S.E. = .26)
Authoritarianism	2.45	.59	.831	.047	−.259
Social conservatism	3.31	.91	.799	−.196	−.530
Religiousness	2.68	1.22	/	.012	−1.083
Media objectivity	3.42	1.01	/	−.292	−1.384
Frequency of informing	2.87	.66	.627	.379	.301
Harmless virus	1.62	.81	.874	.276	−.841
Hiding information	2.62	1.07	.859	1.574	2.253
Conspiracy mentality	3.53	.79	.794	−.278	−.290

Results

Descriptive statistics

The means and standard deviations of all variables in question are presented in Table 1, as well as Cronbach alpha coefficients, skewness and kurtosis.

There are no significant gender differences in the outcome variables (conspiracy beliefs and conspiracy mentality), but Hiding Information differs significantly by education ($F_{(2,337)} = 3.59$, p = .029), such that participants with a bachelor's degree scored higher ($M = 1.75$, $SD = .91$) on this variable than participants with a master's degree ($M = 1.49$, $SD = .69$), according to the Scheffe post-hoc test. Also, age correlates significantly with conspiracy mentality (r = −.110, p = .044). Therefore, age and education were included in general linear models as controls.

Relationships among variables

Pearson's correlation coefficients are presented in Table 2. It can be noted that the three dependent variables correlate moderately to highly, which is expected given the unidimensional nature of conspiracy beliefs. Media objectivity has significant negative correlations with all three traditionalist attitudes, while the frequency of informing correlates negatively with the conspiracy belief variables.

Predicting conspiracy beliefs and conspiracy mentality

Three separate multiple regression analyses were applied to check which variables predict conspiracy mentality and the two COVID-related sets of conspiracy beliefs (Table 3). Authoritarianism, conservatism, religiousness, media objectivity, frequency of informing, age and education were included as predictors. All three traditionalist social attitudes predict the Harmless Virus, while Hiding Information is predicted only by authoritarianism, and conspiracy mentality by conservatism and religiousness. Interestingly, frequency of informing negatively predicts all three conspiracy variables,

Table 2. Pearson's correlation coefficients for relationships between the variables in the study.

	1	2	3	4	5	6	7
(1) Authoritarianism	-						
(2) Conservatism	,447**	-					
(3) Religiousness	,367**	,695**	-				
(4) Media objectivity	-,248**	-,317**	-,365**	-			
(5) Frequency of informing	,137*	,065	,071	,004	-		
(6) Harmless virus	,264**	,410**	,393**	-,124*	-,125*	-	
(7) Hiding information	,255**	,262**	,238**	-,056	-,154*	,694**	-
(8) Conspiracy mentality	,124*	,266**	,255**	-,056	-,121*	,660**	,476**

*p < .05, ** p < .01

Table 3. Regression analyses results for predicting conspiracy beliefs and conspiracy mentality.

Predictor	Harmless virus		Hiding information		Conspiracy mentality	
	β	t	β	t	β	t
Authoritarianism	.120	2.178*	.208	3.565***	.030	.505
Conservatism	.242	3.455**	.139	1.872†	.186	2.469**
Religiousness	.219	3.196**	.117	1.617	.157	2.149*
Media objectivity	.065	1.190	.089	1.544	.077	1.321
Frequency of informing	−.164	−3.343**	−.173	−3.336**	−.119	−2.247*
Age	−.028	−.540	−.065	−1.177	−.099	−1.768
Education	−.003	−.059	−.026	−.475	−.010	−.175
F(df)	14.439*** (7,329)		8.044*** (7,329)		6.147*** (7,329)	
R^2	.24		.15		.12	

*$p < .05$, ** $p < .01$, *** $p < .001$, † $p = .062$

while media objectivity does not predict any of them. Neither age nor education are significant predictors in these models.

Mediation analysis

For testing the second and third hypotheses, a path analysis was conducted, i.e. all variables were modeled as observed ones. Conspiracy beliefs and conspiracy mentality were set as outcome variables, authoritarianism, religiousness and conservatism as predictors, and media objectivity and frequency of informing as mediators. Given that none of the social attitudes had a direct effect on media objectivity, nor did media objectivity predict any of the outcome variables, this mediator was removed from the model. The final model (Figure 1) has an excellent fit ($\chi^2(5) = 4.540$, p = .475; NFI = 0.995; CFI = 1; RMSEA = 0.000). It can be noted that the frequency of informing mediates only the relationships between authoritarianism and all outcome variables. Mediation effects are significant (as indicated by the bootstrapping using 95% confidence intervals) for conspiracy mentality $\beta = −.02$, p = .035, Hiding Information $\beta = −.03$, p = .01, and Harmless Virus $\beta = −.02$, p = .01. Also, authoritarianism has direct effects on COVID-19-related conspiracy beliefs. Religiousness has only a direct effect on the Harmless Virus, while conservatism has direct effects on both conspiracy belief sets and conspiracy mentality.
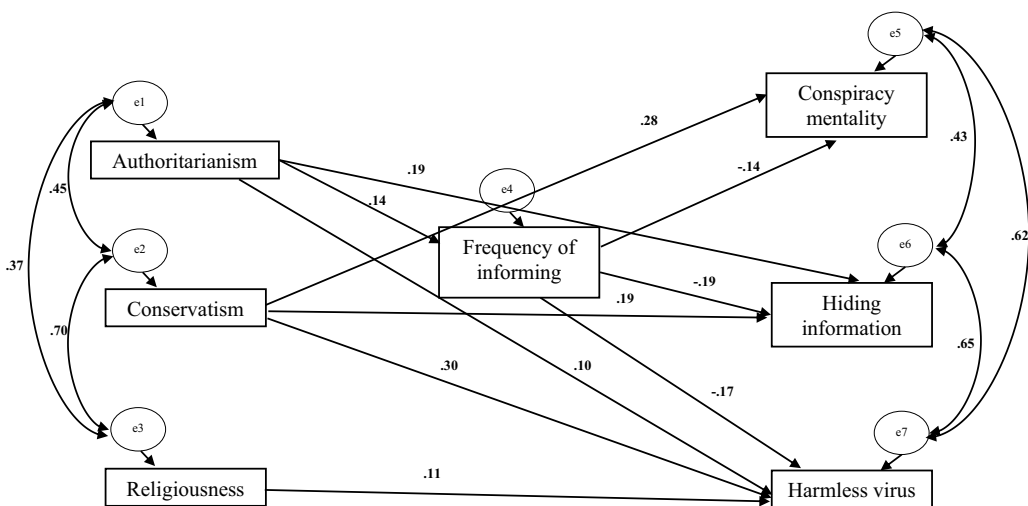

Figure 1. Path analysis of the relations between social attitudes and conspiracy beliefs, mediated by the frequency of informing.

Discussion

The COVID-19 pandemic is a societal crisis that has provoked the emergence of numerous conspiracy theories, whose spread has been aided by the media. Conspiracy beliefs are related to lower adherence to preventive behaviors and support for anti-COVID policies (e.g., Earnshaw et al., 2019; Imhoff & Lamberty, 2020; Karić & Međedović, 2021), therefore it is important to understand how they can be fought. In this study, the aim was to explore how particular social attitudes – authoritarianism, religiousness, and social conservatism – predict specific COVID-19 conspiracy beliefs, as well as the more general factor of conspiracy mentality. The role of behaviors related to informing oneself about the pandemic – the frequency of informing and the objectivity of information sources – was also explored.

We hypothesized that authoritarianism (H1a), conservatism (H1b) and religiousness (H1c) significantly positively predict conspiracy beliefs and conspiracy mentality. We also hypothesized that these relationships are mediated by the objectivity of the media (H2) and the frequency of informing (H3).

Our first hypothesis is partially confirmed. Although all bivariate correlations between social attitudes, conspiracy beliefs and conspiracy mentality are significant (and positive), when taken together not all social attitudes predict every conspiracy belief. Authoritarianism predicts the two sets of conspiracy beliefs related to COVID-19. This result was expected, given that the previous literature has reported on the relationship between authoritarianism and different conspiracy beliefs numerous times (e.g., Goldberg & Richey, 2020; Swami, 2012). One of the mechanisms proposed to explain this relationship is the shared belief in a dangerous world, which actually acts as a precursor for right-wing authoritarianism (Duckitt et al., 2002). Individuals who tend to perceive the world as dangerous are more prone to embracing ideologies that favor security and stability (Sibley et al., 2012). In crises that provoke reduced control and uncertainty, people turn to conspiracy theories for an explanation of the causes of the events (Van Prooijen & Douglas, 2017). However, in a set of studies by Imhoff and Bruder (2014), authoritarianism did not correlate significantly, or correlated weakly, with conspiracy mentality. In our study, the results are in accordance with these results: authoritarianism has a weak bivariate correlation with conspiracy mentality, and it does not predict conspiracy mentality neither in regression nor path analysis. This might lead to a conclusion that it is not a general tendency for conspirational thinking, but rather context or situation-specific conspiracy beliefs that are related to authoritarianism – exactly the situations that can be perceived as more directly threatening und uncertain. This suggestion may be supported by the findings of Grzesiak-Feldman (2012) who demonstrated that authoritarianism is the strongest predictor of conspiracy beliefs about specific events.

Social conservatism predicts both groups of COVID-19 conspiracy beliefs and conspiracy mentality. The relationship between conservatism and conspiracy beliefs has been identified in previous studies (e.g., Van der Linden et al., 2021). One of the potential explanations may lie in characteristics associated with conservatism: conservative individuals are more averse to ambiguity, which was prominent at the beginning of the pandemic, more cognitively rigid, and have a stronger desire for order and structure (Jost et al., 2018) – a notion they share with people high on authoritarianism. Therefore, their tendency to hold stronger conspiracy beliefs may come from the need for understanding and maintaining the illusion of control. In addition, Jost et al. (2017) found a firm support for the "conservative shift" hypothesis: in situations in which public perceptions of threat are high, people tend to stick to the conservative rigidity that serves epistemic needs, much like conspiracy beliefs (Douglas et al., 2017).

In regression analyses, religiousness is a significant predictor of beliefs that the virus is harmless, and of a general conspiratorial mind-set. In relation to path analysis, among the three traditionalist social attitudes, religiousness is shown to be the weakest predictor of conspiracy ideation: it no longer has a direct effect on conspiracy mentality, but only on believing in the harmlessness of the virus (which is probably due to the covariation of the outcome variables), and it is not related to the

mediator. In previous studies, it was found that "only" the degree of religiousness correlates very weakly or does not correlate at all with a general tendency toward conspiratorial thinking, as well as with some specific conspiracy beliefs (e.g., Hart & Graether, 2018; S. Kim & Kim, 2021). There is, however, a share of the variance of conspiracy beliefs that is predicted by religiousness, indicating that its effect cannot be neglected. In previous literature, it is argued that conspiracy beliefs and religiousness share certain elements like prophecy and paranormal activity (Robertson & Dyrendal, 2018). However, these might not be the only elements they share. Religiousness has been identified as a response to uncertainty, both personal and in other domains of life (Hogg et al., 2010). Conspiracy beliefs are found to have similar characteristics: they give people the illusion of control (Imhoff & Lamberty, 2020) and make sense of ambiguity in crisis situations (Wood, 2018). The (strongest) direct effect of religiousness on believing that the virus is harmless might be explained by this mechanism of response to an uncertain situation, especially given that the study was conducted in the beginning of the pandemic, during the state of emergency, which may have contributed to heightened risk perception, while little was known about the virus and the disease itself.

Our third hypothesis was also partially confirmed. The only mediation effects of the frequency of informing in our model were in the relationships between authoritarianism and all three outcome variables. In the mediation model, the role of the frequency with which information about the COVID-19 pandemic is sought from different sources may be explained by the needs of more authoritarian individuals to reduce feelings of threat they perceive. The introduction of the state of emergency likely contributed to perceptions of the level of seriousness of the threat, and authoritarian individuals sought more clarity and understanding. This led to gathering information about the pandemic more often. In turn, as they received more information, their understanding might have increased and the perception of threat decreased, leading to a decrease in conspiracy beliefs. The proposed mechanism should be further studied.

Surprisingly, the objectivity of the media sources participants inform themselves through does not play a significant role in predicting either conspiracy mentality, or specific COVID-19 conspiracy beliefs, leading to the rejection of the second hypothesis. However, this finding is in contrast with previous studies (e.g., S. Kim & Kim, 2021). Possible reasons for the insignificance of source objectivity for conspiracy theories may lie in several psychological mechanisms. First, the lingering effect of misinformation (Ecker et al., 2017) indicates that the original information leaves traces on attitudes even after (repeated) counter-argumentation, because cognitive representations remain in the memory. The second mechanism is the sleeper effect (Hovland et al., 1949), i.e. the dissociation of the message from the source due to discounting cues (unworthy of consideration because it is not credible). The effect of such information will remain significant for recipient's attitudes because the fake information prevails in the memory while the source fades away, despite the person's awareness of the nature of the source (Krekó, 2020). The third potential mechanism is motivated reasoning, i.e. the theory that conspiracy beliefs are rooted in a wider set of beliefs and serve as advantages for the ingroup, such as the external attribution of blame, collective self-esteem etc. (Krekó, 2015). In our study, media objectivity clearly correlates negatively with social attitudes and with beliefs that the virus is harmless. It might be argued that media objectivity itself does not directly predict conspiracy beliefs, but its relationship with conspiracy beliefs takes place entirely through attitudes: more authoritarian, religious and conservative individuals systematically follow less objective media. However, conspiracy beliefs are not related to which media they follow, but only to attitudinal dispositions. These assumptions require further research.

The absence of significance in predicting conspiracy beliefs by media objectivity may also lie in the operationalization of the variable. We assessed whether the source objectively reported about the pandemic or not. However, studies have shown that it is the credibility of sources that is relevant (e.g., Maier et al., 2017), and the attribution of credibility is related to similarities between the source and the message receiver, especially in terms of attitudes and ideology (Marks et al., 2019; Simons et al., 1970; Sterrett et al., 2019). In addition, there are indications that people tend to disregard news as fake if they come from the sources that are in contradiction with their ideological stance (Van der Linden et al.,

2020). However, we were interested in an objective assessment of the influence of the government on the media, i.e. whether real media objectivity contributes to the decrease of conspiracy beliefs. These complex relationships between social attitudes, conspiracy beliefs and media sources require additional attention and more studies to be better understood.

Limitations

Like any other study, this one too has its limitations. First, the sample was convenient and relatively small, which significantly influences the generalizability of the results. It was also collected only via social media, that way excluding participants who do not use social media. Second, religiousness was measured with a single item, thus not being able to capture structural differences in being religious and the level of attachment to a religion. This has prevented us from making any further assumptions or explanations about the relationship between religiousness and conspiracy beliefs. Third, the objectivity of the media sources respondents inform themselves through was assessed. However, the previous studies have indicated that it is the credibility, and not objectivity, of the source that makes a difference. Fourth, we did not include attention checks in the study, which might have increased the probability of a Type I error (Abbey & Meloy, 2017), although some studies indicate that excluding inattentive participants does not significantly influence study results (Gummer et al., 2021) or scale validity (Kung et al., 2018). Although we excluded multivariate outliers, using attention checks would have made the results more trustworthy. In addition, the questionnaires were not counterbalanced. We did find the order of the questions presented to the participants important and carefully planned: we chose to present items in order of decreasing importance to the whole study, and in multiple blocks to avoid burdening respondents. Another possible limitation is the right skewness and a leptokurtic distribution of the Hiding information variable, and platykurtic distributions of religiousness and media objectivity variables. We did normalize the data before conducting analyses, however, these distributions might have influenced the results. Also, the radio was accidentally omitted as an information source. Although it would be better if it had been included, it might happen that it would not contribute greatly to changes in results. According to a study on a nationally representative sample (Komatina & Antović, 2021), around 75% of participants does not use or use radio very rarely, and only 2% uses the radio as the predominant source of informing. Participants inform themselves most frequently from other people, social media, and television.

Suggestions for further studies

From these limitations, suggestions for future studies arise. A more appropriate sample should be collected to test the described relationships. Future studies should ask participants not only which sources they use to inform themselves, but also how much they trust them, i.e. they should measure the perceived credibility of the sources. Our assumption was that credibility would be a significant mediator of the relationship between social attitudes and conspiracy beliefs. Additionally, a serial mediation model could also be tested, where media objectivity and perceived credibility would be entered as subsequent mediators. We also think it would be interesting to explore motivated reasoning in choosing the sources of information, and its impact on endorsing conspiracy beliefs. Finally, we believe that the role of seeking information in a crisis on the relationship between authoritarianism and endorsement of conspiracy beliefs is worthy of further exploration.

Conclusion

To conclude, to the best of our knowledge, this is one of the first studies exploring the relationships between traditionalist social attitudes and COVID-related conspiracy beliefs. We consider the inclusion of individual difference variables in a model predicting the endorsement of conspiracy beliefs, but also for predicting the behavioral responses of seeking information in a crisis, important for better

understanding the mechanisms contributing to conspiracy beliefs. Although endorsing conspiracy beliefs has "benefits" at the individual level (e.g., inducing the illusion of control), at the societal level they are harmful, which has been demonstrated during the COVID-19 pandemic as decreased adherence to preventive measures, policies, or the tendency to get vaccinated.

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Data availability statement

The data described in this article are openly available in the Open Science Framework at https://doi.org/10.17605/OSF.IO/N5X8T.

Open Scholarship

This article has earned the Center for Open Science badges for Open Data and Open Materials through Open Practices Disclosure. The data and materials are openly accessible at https://doi.org/10.17605/OSF.IO/N5X8T.

References

Abalakina-Paap, M., Stephan, W. G., Craig, T., & Gregory, W. L. (1999). Beliefs in conspiracies. *Political Psychology*, *20*(3), 637–647. https://doi.org/10.1111/0162-895X.00160

Abbey, J. D., & Meloy, M. G. (2017). Attention by design: Using attention checks to detect inattentive respondents and improve data quality. *Journal of Operations Management*, *53*(1), 63–70. https://doi.org/10.1016/j.jom.2017.06.001

Adam-Troian, J., Wagner-Egger, P., Motyl, M., Arciszewski, T., Imhoff, R., Zimmer, F., van Prooijen, J. W., Bangerter, A., Bilewicz, M., Blanuša, N., Bovan, K., Bužarovska, R., Cichocka, A., Çelebi, E., Delouvée, S., Douglas, K. M., Dyrendal, A., Gjoneska, B., Graf, S., . . . Klein, O. (2021). Investigating the links between cultural values and belief in conspiracy theories: The key roles of collectivism and masculinity. *Political Psychology*, *42*(4), 597–618. https://doi.org/10.1111/pops.12716

Allington, D., Duffy, B., Wessely, S., Dhavan, N., & Rubin, J. (2020). Health-protective behavior, social media usage and conspiracy belief during the COVID-19 public health emergency. *Psychological Medicine 51*(10), 1763–1769. https://doi.org/10.1017/S003329172000224X

Alper, S., Bayrak, F., & Yilmaz, O. (2020). Psychological correlates of COVID-19 conspiracy beliefs and preventive measures: Evidence from Turkey. *Current Psychology 40*(11), 5708–5717. https://doi.org/10.1007/s12144-020-00903-0

Apuke, O. D., & Omar, B. (2021). Fake news and COVID-19: Modelling the predictors of fake news sharing among social media users. *Telematics and Informatics*, *56*, 101475. https://doi.org/10.1016/j.tele.2020.101475

Bierwiaczonek, K., Kunst, J. R., & Pich, O. (2020). Belief in COVID-19 conspiracy theories reduces social distancing over time. *Applied Psychology: Health and Well-Being*, *12*(4), 1270–1285. https://doi.org/10.1111/aphw.12223

Bridgman, A., Merkley, E., Loewen, P. J., Owen, T., Ruths, D., Teichmann, L., & Zhilin, O. (2020). The causes and consequences of COVID-19 misperceptions: Understanding the role of news and social media. *Harvard Kennedy School Misinformation Review 1*(3). https://doi.org/10.37016/mr-2020-028

Bruder, M., Haffke, P., Neave, N., Nouripanah, N., & Imhoff, R. (2013). Measuring individual differences in generic beliefs in conspiracy theories across cultures: Conspiracy mentality questionnaire. *Frontiers in Psychology*, *4*, 225. https://doi.org/10.3389/fpsyg.2013.00225

Dechêne, A., Stahl, C., Hansen, J., & Wänke, M. (2010). The truth about the truth: A meta-analytic review of the truth effect. *Personality and Social Psychology Review*, *14*(2), 238–257. https://doi.org/10.1177/1088868309352251

Douglas, K. M., Sutton, R. M., & Cichocka, A. (2017). The psychology of conspiracy theories. *Current Directions in Psychological Science*, *26*(6), 538–542. https://doi.org/10.1177/0963721417718261

Duckitt, J., Wagner, C., Du Plessis, I., & Birum, I. (2002). The psychological bases of ideology and prejudice: Testing a dual process model. *Journal of Personality and Social Psychology*, *83*(1), 75. https://doi.org/10.1037/0022-3514.83.1.75

Earnshaw, V. A., Bogart, L. M., Klompas, M., & Katz, I. T. (2019). Medical mistrust in the context of Ebola: Implications for intended care-seeking and quarantine policy support in the United States. *Journal of Health Psychology*, *24*(2), 219–228. https://doi.org/10.1177/1359105316650507

Ecker, U. K., Hogan, J. L., & Lewandowsky, S. (2017). Reminders and repetition of misinformation: Helping or hindering its retraction? *Journal of Applied Research in Memory and Cognition*, *6*(2), 185–192. https://doi.org/10.1016/j.jarmac.2017.01.014

European Commission. (2020). *Serbia 2020 report*. https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/serbia_report_2020.pdf?fbclid=IwAR3fX3kRhggeGhlceDcrwg902EFSKS5QQrXnVh6IeUsypdo8g85DIs4-BVU

Everett, J. A. (2013). The 12-item social and economic conservatism scale (SECS). *PloS one*, *8*(12), e82131. https://doi.org/10.1371/journal.pone.0082131

Feldman, S., & Johnston, C. (2014). Understanding the determinants of political ideology: Implications of structural complexity. *Political Psychology*, *35*(3), 337–358. https://doi.org/10.1111/pops.12055

Galliford, N., & Furnham, A. (2017). Individual difference factors and beliefs in medical and political conspiracy theories. *Scandinavian Journal of Psychology*, *58*(5), 422–428. https://doi.org/10.1111/sjop.12382

Goldberg, Z. J., & Richey, S. (2020). Anti-vaccination beliefs and unrelated conspiracy theories. *World Affairs*, *183*(2), 105–124. doi:10.1177/2F0043820020920554.

Grzesiak-Feldman, M. (2012). Prawicowyautorytaryzmorazorientacjanadominacjęspołecznąjakopredyktoryróżnych form myśleniaspiskowego [Predicting conspiracy beliefs: The role of right-wing authoritarianism and social dominance orientation]. *PsychologiaSpołeczna*, *7*(20), 48–64. https://www.ceeol.com/search/article-detail?id=94528

Gummer, T., Roßmann, J., & Silber, H. (2021). Using instructed response items as attention checks in web surveys: Properties and implementation. *Sociological Methods & Research*, *50*(1), 238–264. https://doi.org/10.1177/2F0049124118769083

Hart, J., & Graether, M. (2018). Something's going on here. Psychological predictors of belief in conspiracy theories. *Journal of Individual Differences*, *39*(4), 229–237. https://doi.org/10.1027/1614-0001/a000268

Hogg, M. A., Adelman, J. R., & Blagg, R. D. (2010). Religion in the face of uncertainty: An uncertainty-identity theory account of religiousness. *Personality and Social Psychology Review*, *14*(1), 72–83. https://doi.org/10.1177/2F1088868309349692

Hovland, C. I., Lumsdaine, A. A., & Sheffield, F. D. (1949). *Experiments on mass communication. (Studies in social psychology in World War II)*. Princeton University Press.

Imhoff, R., & Bruder, M. (2014). Speaking (un–) truth to power: Conspiracy mentality as a generalised political attitude. *European Journal of Personality*, *28*(1), 25–43. https://doi.org/10.1002/per.1930

Imhoff, R., & Lamberty, P. (2020). A bioweapon or a hoax? The link between distinct conspiracy beliefs about the Coronavirus disease (COVID-19) outbreak and pandemic behavior. *Social Psychological and Personality Science*, *11*(8), 1110–1118. https://doi.org/10.1177/1948550620934692

Imhoff, R., Zimmer, F., Klein, O., António, J. H., Babinska, M., Bangerter, A., Bilewicz, M., Blanuša, N., Bovan, K., Bužarovska, R., Cichocka, A., Delouvée, S., Douglas, K. M., Dyrendal, A., Etienne, T., Gjoneska, B., Graf, S., Gualda, E., Hirschberger, G., . . . Van Prooijen, J. W. (2022). Conspiracy mentality and political orientation across 26 countries. *Nature Human Behaviour*, 6(3), 392–403. https://doi.org/10.1038/s41562-021-01258-7

Jasinskaja-Lahti, I., & Jetten, J. (2019). Unpacking the relationship between religiosity and conspiracy beliefs in Australia. *British Journal of Social Psychology*, 58(4), 938–954. https://doi.org/10.1111/bjso.12314

Jost, J. T., Stern, C., Rule, N. O., & Sterling, J. (2017). The politics of fear: Is there an ideological asymmetry in existential motivation? *Social Cognition*, 35(4), 324–353. https://doi.org/10.1521/soco.2017.35.4.324

Jost, J. T., van der Linden, S., Panagopoulos, C., & Hardin, C. D. (2018). Ideological asymmetries in conformity, desire for shared reality, and the spread of misinformation. *Current Opinion in Psychology*, 23, 77–83. https://doi.org/10.1016/j.copsyc.2018.01.003

Karić, T., & Međedović, J. (2021). Covid-19 conspiracy beliefs and containment-related behaviour: The role of political trust. *Personality and Individual Differences*, 175, 110697. https://doi.org/10.1016/j.paid.2021.110697

Kešetović, Ž. (2020). Crisis communication in the COVID-19 pandemic in the Republic of Serbia – Between Hippocrates and Machiaveli. *The Culture of Polis*, 17(2), 151–165. https://kpolisa.com/KPP2020_2/EN/11.KesetovicEN.pdf

Kim, M., & Cao, X. (2016). The impact of exposure to media messages promoting government conspiracy theories on distrust in the government: Evidence from a two-stage randomized experiment. *International Journal of Communication*, 10, 20. https://ijoc.org/index.php/ijoc/article/view/5127

Kim, L., Fast, S. M., & Markuzon, N. (2019). Incorporating media data into a model of infectious disease transmission. *PLOS ONE*, 14(2), e0197646. https://doi.org/10.1371/journal.pone.0197646

Kim, S., & Kim, S. (2021). Searching for general model of conspiracy theories and its implication for public health policy: Analysis of the impacts of political, psychological, structural factors on conspiracy beliefs about the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, 18(1), 266. https://doi.org/10.3390/ijerph18010266

Komatina, S., & Antović, T. (2021). *Građani i mediji. Izveštaj iz istraživanja javnog mnjenja [Citizens and the media. Report on public opinion research]*. CESID. http://www.cesid.rs/wp-content/uploads/2021/12/Ciklus-III-GRADANI-I-MEDIJI.pdf

Krekó, P. (2015). Conspiracy theory as collective motivated cognition. In M. Bilewicz & A. Cichocka (Eds.), *The psychology of conspiracy* (pp. 62–76). Routledge.

Krekó, P. (2020). Countering conspiracy theories and misinformation. In M. Butter & P. Knight (Eds.), *Routledge Handbook of conspiracy theories* (pp. 242–256). Routledge.

Kung, F. Y., Kwok, N., & Brown, D. J. (2018). Are attention check questions a threat to scale validity? *Applied Psychology*, 67(2), 264–283. https://doi.org/10.1111/apps.12108

Little, R., & Rubin, D. (2019). *Statistical analysis with missing data* (3rd ed.). Wiley. https://doi.org/10.1002/9781119482260

Ludeke, S., Johnson, W., & Bouchard, T. J., Jr. (2013). "Obedience to traditional authority:" A heritable factor underlying authoritarianism, conservatism and religiousness. *Personality and Individual Differences*, 55(4), 375–380. https://doi.org/10.1016/j.paid.2013.03.018

Maier, M., Adam, S., & Maier, J. (2017). Does the messenger matter? A comparison of the effects of Eurosceptic messages communicated by mainstream and radical right-wing parties on citizens' EU attitudes. *Journal of Elections, Public Opinion and Parties*, 27(3), 330–349. https://doi.org/10.1080/17457289.2016.1273227

Mancosu, M., & Vegetti, F. (2020). "Is it the message or the messenger?": Conspiracy endorsement and media sources. *Social Science Computer Review* 39(6), 1203–1217. https://doi.org/10.1177/0894439320965107

Marks, J., Copland, E., Loh, E., Sunstein, C. R., & Sharot, T. (2019). Epistemic spillovers: Learning others' political views reduces the ability to assess and use their expertise in nonpolitical domains. *Cognition*, 188(July), 74–84. https://doi.org/10.1016/j.cognition.2018.10.003

Mihić, V., Čolović, P., Bodroža, B., & Biro. M. I Smederevac, S. (2010). Procena autoritarnosti [Assessment of authoritarianism. In M. Biro, S. Smederevac, & Z. Novović (Eds.), *Procena psiholoških i psihopatoloških fenomena [The assessment of psychological and psychopathological phenomena]*. Center for applied psychology Belgrade (p. 153–163) .

Milutinović, I. (2021). Media framing of COVID-19 pandemic in the transitional regime of Serbia: Exploring discourses and strategies. *Media, Culture & Society*, 43(7), 1311–1327. https://doi.org/10.1177/0163443720986003

Oliver, J. E., & Wood, T. (2014). Medical conspiracy theories and health behaviors in the United States. *JAMA Internal Medicine*, 174(5), 817–818. https://doi.org/10.1001/jamainternmed.2014.190

Pennycook, G., McPhetres, J., Zhang, Y., Lu, J. G., & Rand, D. G. (2020). Fighting COVID-19 misinformation on social media: Experimental evidence for a scalable accuracy-nudge intervention. *Psychological Science*, 31(7), 770–780. https://doi.org/10.1177/0956797620939054

Petrović, B., Međedović, J., Radović, O., & Lovrić, S. R. (2019). Conspiracy mentality in post-conflict societies: Relations with the ethos of conflict and readiness for reconciliation. *Europe's Journal of Psychology*, 15(1), 59–81. https://doi.org/10.5964/ejop.v15i1.1695

Porumbescu, G. A., Lindeman, M. I., Ceka, E., & Cucciniello, M. (2017). Can transparency foster more understanding and compliant citizens? *Public Administration Review*, 77(6), 840–850. https://doi.org/10.1111/puar.12790

Robertson, D. G., & Dyrendal, A. (2018). Conspiracy theories and religion; superstition, seekership, and salvation. In J. E. Uscinski (Ed.), *Conspiracy theories and the people who believe them* (pp. 411–421). Oxford University Press.

Saucier, G. (2000). Isms and the structure of social attitudes. *Journal of Personality and Social Psychology*, *78*(2), 366–385. https://doi.org/https://psycnet.apa.org/doi/10.1037/0022-3514.78.2.366

Sibley, C. G., Osborne, D., & Duckitt, J. (2012). Personality and political orientation: Meta-analysis and test of a threat-constraint model. *Journal of Research in Personality*, *46*(6), 664–677. https://doi.org/10.1016/j.jrp.2012.08.002

Simons, H. W., Berkowitz, N. N., & Moyer, R. J. (1970). Similarity, credibility, and attitude change: A review and a theory. *Psychological Bulletin*, *73*(1), 1. https://doi.org/10.1037/h0028429

Stein, R. A., Ometa, O., Shetty, S. P., Katz, A., Popitiu, M. I., & Brotherton, R. (2021). Conspiracy theories in the era of COVID-19: A tale of two pandemics. *International Journal of Clinical Practice*, *75*(2), e13778. https://dx.doi.org/10.1111%2Fijcp.13778

Stempel, C., Hargrove, T., & Stempel, G. H., III. (2007). Media use, social structure, and belief in 9/11 conspiracy theories. *Journalism & Mass Communication Quarterly*, *84*(2), 353–372. https://doi.org/10.1177/107769900708400210

Sterrett, D., Malato, D., Benz, J., Kantor, L., Tompson, T., Rosenstiel, T., . . . Loker, K. (2019). Who shared it?: Deciding what news to trust on social media. *Digital Journalism*, *7*(6), 783–801. https://doi.org/10.1080/21670811.2019.1623702

Swami, V., Chamorro-Premuzic, T., & Furnham, A. (2010). Unanswered questions: A preliminary investigation of personality and individual difference predictors of 9/11 conspiracist beliefs. *Applied Cognitive Psychology*, *24*(6), 749–761. https://doi.org/10.1002/acp.1583

Swami, V. (2012). Social psychological origins of conspiracy theories: The case of the Jewish conspiracy theory in Malaysia. *Frontiers in Psychology*, *3*, 280. https://doi.org/10.3389/fpsyg.2012.00280

Swami, V., & Furnham, A. (2014). Political paranoia and conspiracy theories. In J. W. van Prooijen & P. A. M. van Lange (Eds.), *Power politics, and paranoia: Why people are suspicious about their leaders* (pp. 218–236). Cambridge University Press.

van der Linden, S., Panagopoulos, C., & Roozenbeek, J. (2020). You are fake news: Political bias in perceptions of fake news. *Media, Culture & Society*, *42*(3), 460–470. https://doi.org/10.1111/pops.12681

Van der Linden, S., Panagopoulos, C., Azevedo, F., & Jost, J. T. (2021). The paranoid style in American politics revisited: An ideological asymmetry in conspiratorial thinking. *Political Psychology*, *42*(1), 23–51. https://doi.org/10.1177/0163443720906992

Van Prooijen, J. W., & Douglas, K. M. (2017). Conspiracy theories as part of history: The role of societal crisis situations. *Memory Studies*, *10*(3), 323–333. https://doi.org/10.1177/1750698017701615

Van Prooijen, J. (2018). *The psychology of conspiracy theories*. Routledge.

Wood, M. J., Douglas, K. M., & Sutton, R. M. (2012). Dead and alive: Beliefs in contradictory conspiracy theories. *Social Psychological and Personality Science*, *3*(6), 767–773. https://doi.org/10.1177/2F1948550611434786

Wood, M. J. (2018). Propagating and debunking conspiracy theories on Twitter during the 2015–2016 Zika virus outbreak. *Cyberpsychology, Behaviour, and Social Networking*, *21*(8), 485–490. https://doi.org/10.1089/cyber.2017.0669

World health Organization. (2020a). *Immunizing the public against misinformation*. Retrieved 13 December, 2021, from https://www.who.int/news-room/feature-stories/detail/immunizing-the-public-against-misinformation

World health Organization. (2020b). *Situation report 13*. Retrieved 19 May, 2021, from https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200202-sitrep-13-ncov-v3.pdf?sfvrsn=195f4010_6

Zhao, E., Wu, Q., Crimmins, E. M., & Ailshire, J. A. (2020). Media trust and infection mitigating behaviors during the COVID-19 pandemic in the USA. *BMJ Global Health*, *5*(10), e003323. http://dx.doi.org/10.1136/bmjgh-2020-003323