Who Thinks COVID-19 is a Hoax? Psychological Correlates of Beliefs in Conspiracy Theories and Attitudes Towards Anti-Coronavirus Measures at the End of the First Lockdown in Germany

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ABSTRACT

The reported dataset addresses potential correlates and predictors of beliefs in conspiracy theories about the COVID-19 pandemic. Different psychological constructs (self-esteem, Dark Triad personality traits, collective narcissism, political attitude, individualism/collectivism), social status, and socio-demographic variables were assessed. Data from 746 participants from all parts of Germany who study part-time while working were collected between May 26 to July 5, 2020. We used a cross-sectional online survey comprising a total of 98 items. Preliminary analysis revealed sound psychometric properties of the measures. These data provide several opportunities for further use and can be utilized for research and educational purposes. For example, comparisons can be drawn between existing research on conspiracy theories to determine whether known factors determining beliefs in conspiracy theories are also relevant for COVID-19. All data and additional materials (e.g., codebook of all items, R code) are available at https://osf.io/p6q7w/.

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(1) BACKGROUND

Many people are drawn to conspiracy theories. For example, a German study conducted before the COVID-19 pandemic with a representative sample ($N = 1,890$) showed that 46% of the respondents thought secret organizations influenced political decisions. The study also reported that every second participant trusted his or her own gut feeling and intuition more than the experts. In addition, almost a quarter of respondents suspect that media and politics are in cahoots (Zick et al., 2019).

Various theoretical models and antecedents to explain the belief in conspiracy theories have been suggested (see Douglas et al., 2017 for an overview). One explanation suggests that conspiracy theories valorize the self and give a sense of control. Research has indeed shown that members of groups with objectively low (vs. high) status (Crocker et al., 1999) and people who feel to be on the losing (vs. winning) side of political processes (Uscinski & Parent, 2014) are more likely to believe in conspiracy theories. When looking at personality traits, conspiracy beliefs are associated with individual narcissism and low self-esteem (Cichocka, Marchlewska, & Golec de Zavala, 2016). Whereas narcissism was a significant predictor of belief in conspiracy theories across a series of three studies, self-esteem was negatively related only when the overlap between narcissism and self-esteem was accounted for. Thus, belief in conspiracy theories are supposed to be negatively associated with secure self-evaluation without a narcissistic component (Cichocka, Marchlewska, & Golec de Zavala, 2016). In addition, collective narcissism can also predict believing in conspiracy theories (Cichocka, Marchlewska, Golec de Zavala, & Olechowski, 2016). Generally, research on the psychological consequences of believing in conspiracy theories in the long term is relatively scarce (Douglas et al., 2017). However, studies found that exposure to conspiracy theories can decrease trust in governmental institutions (Einstein & Glick, 2015) and cause disenchantment with politicians and scientists (Jolley & Douglas, 2014).

In times of crisis, beliefs in conspiracy theories can increase substantially (Van Prooijen & Douglas, 2017). The COVID-19 pandemic has been an almost unprecedented public health emergency of international concern. In this context, beliefs in conspiracy theories might be a potential risk factor for decreasing compliance with protective measures (e.g., wearing face masks or keeping social distance). At the time the presented data were collected, some studies had already shown that people who believed that COVID-19 is a hoax or belittled the risks of a COVID-19 infection reported reduced containment-related behavior and were less likely to follow official recommendations (Bierwiaczonek et al., 2020; Imhoff & Lamberty, 2020). In addition, belief in conspiracy theories about COVID-19 was found to be associated with an almost four times lower intention to vaccinate (Earnshaw et al., 2020).

In this context, the presented dataset addresses known antecedents of belief in conspiracy theories concerning COVID-19 as well as the relationship with relevant behaviors and attitudes regarding anti-COVID-19 measures.

(2) METHODS

2.1 STUDY DESIGN

Data were collected using a cross-sectional online survey. Participants were asked to complete an online questionnaire with 98 items. The study and all measurement instruments were preregistered (https://osf.io/b6azp). We measured the following concepts: self-esteem, Dark Triad personality traits, collective narcissism, political attitude, individualism/collectivism, belief in conspiracy theories, preference for anti-COVID-19 measures, acceptance of contact tracing apps, and risk perceptions). In addition, two potential moderator variables, education, and social status were collected, next to socio-demographic variables (e.g., age, gender, occupational status) and worries about job loss or financial losses due to the COVID-19 pandemic. Finally, since we aimed at recruiting participants from a university, we asked participants to provide a unique code to grant research participation credit (students have to take part in studies and experiments carried out by researches of the university).

2.2 TIME OF DATA COLLECTION

The data were collected between May 26 to July 5, 2020. Due to the COVID-19 pandemic, special regulations were in effect in Germany. In Germany, the lockdown began on March 22 and significantly reduced public life. Most businesses (except for daily needs) were closed, as were schools, childcare facilities, and restaurants (a more detailed overview can be found in Steinmetz et al., 2021). After May 4, the COVID-19 lockdown regulations were relaxed, such as some schools reopened. As of May 11, restaurants were also allowed to reopen under certain conditions. From June 15, restrictions were further reduced, and public life slowly began to normalize over the summer before entering the next severe wave of the pandemic.

2.3 LOCATION OF DATA COLLECTION

All participants were residing in Germany at the time of participation, their nationality was not collected. Data were collected across Germany; therefore, participants were asked to provide the first two numbers of their zip codes. Apart from this, there was no other eligibility criterion for considering respondents to be resident in

Germany. The zip codes structure Germany into ten regions (detailed information on the regions that are associated with the zip codes are distributed by the Statistisches Bundesamt (2021)). Most participants were from region four, followed by regions five, two, and eight; region seven was the least represented with only 22 persons (see Table 1 for all regions). Two participants did not provide their zip code initials.

2.4 SAMPLE

The sample was recruited via an online pool at the FOM University, a university of applied sciences with locations in 32 cities across Germany. Participants were informed about the purpose of the survey and gave consent prior to participation. The consent also included that the data would be used for publication and stored as open data in the Open Science Framework. Participants received course credit for participation; no compensation was paid beyond this. The online questionnaire was set to "require" answers from participants apart from the demographic variables. Thus, there are no missing values on the psychological measures in the dataset.

Participants were 746 (71% female) undergraduate students with an average age of 26.39 years (SD_{age} = 4.23, $Range_{age}$ = 19–52). The high percentage of female students is typical for the social sciences. Table 2 gives an overview of the different educational levels within the sample.

Since the programs at this university are designed to combine study and work, 91% of the participants worked at least part-time (average weekly working hours

M = 31.88, SD = 9.34). On average, participants worked from home almost half of their time (M = 42%, SD = 41.01), and 145 participants (19%) were in the German short-time working scheme called "Kurzarbeit".

Overall, participants were not very concerned about losing their jobs as a result of the COVID-19 pandemic (M = 1.92, SD = 1.19; 5-point Likert scale from 1 = "not at all" to 5 = "very strong"). Furthermore, the participants did not worry very much about financial losses (M = 1.78, SD = 1.16; 5-point Likert scale from 1 = "not at all" to 5 = "very strong").

The data also includes information on the living situations. On average, a participant lived with 1.24 (SD = 1.09) additional people in a household. The vast majority had no children (97%). However, 90% of those who had children reported no childcare was available due to the lockdown (e.g., closed schools or daycare facilities).

Regarding their current COVID-19 status, six participants reported being infected with COVID-19. Another three participants waited for their test results while four were in quarantine. Almost a third of the participants knew a friend or family member infected with the Coronavirus. Thirty-five participants (4.70%) reported that a friend or family member has deceased due to a COVID-19 infection. Thirty-four percent of participants reported engaging in social distancing and only leaving their homes when necessary.

2.5 MEASURES

We used a set of psychological instruments to assess participants' belief in conspiracy theories, perceived

Region	0	1	2	3	4	5	6	7	8	9
Number participants	27	24	121	25	181	123	60	22	119	42

Table 1 Allocation of the participants over the ten different regions of the zip code in Germany.

EDUCATION	N	PERCENTAGE
1 (no formal education)	0	0%
2 (currently attending school)	0	0%
3 (primary school)	0	0%
4 (middle school)	11	1.47%
5 (vocational training)	106	14.21%
6 (university of applied sciences entrance qualification, i.e., German Fachhochschulreife)	158	21.18%
7 (university entrance qualification, i.e., German Abitur)	421	56.44%
8 (academic degree, i.e., bachelor, master or higher)	40	5.36%
9 (other)	10	1.34%
Missing values	0	0%
Total	**746**	**100.00%**

Table 2 Overview of education levels in our sample.

risks, attitudes regarding the anti-Coronavirus measures, different psychological constructs (self-esteem, Dark Triad, Collective Narcissism, political attitude, individualism/collectivism), and social status. In addition, socio-demographic variables were examined. All materials were presented in German and are available in an online repository.

Belief in conspiracy theories. Two measures were used to assess participants' belief in conspiracy theories. First, the 4-item measure from van Bavel et al. (2022) examined the belief in four specific conspiracy theories on COVID-19 (7-point scale, 1 = totally disagree to 7 = totally agree; e.g., "The coronavirus (COVID-19) is a bioweapon engineered by scientists", Cronbach's α = .90).

Second, the Flexible Inventory of Conspiracy Suspicions (FICS) was used to further examine beliefs in conspiracy theories about COVID-19 (Wood, 2017). The FICS is a 17-item measure (5-point scale, 1 = totally disagree to 5 = totally agree; e.g., "The real truth about COVID-19 is being kept from the public", Cronbach's α = .98) that can be adapted to assess suspicions of a conspiracy around nearly any topic of public interest.

Risk perception. Risk perception was examined with the 2-item measure from van Bavel et al. (2022) concerning the likelihood of being infected with COVID-19 (e.g., "By April 30, 2021: How likely do you think it is that you will get infected by the Coronavirus (COVID-19)?", Cronbach's α = .88). Participants had to indicate their estimation on a slider ranging from 0% (impossible) to 100% (certain). To measure general risk perception regarding COVID-19, nine additional items (5-point scale, 1 = totally disagree or never to 5 = totally agree or constantly; e.g., "I am worried that I would be infected with COVID-19") were developed by us. With this measure, three levels of psychological distance (i.e., social distance; Lermer et al., 2013) can be distinguished (self: "…that I would be infected…", Cronbach's α = .84; close others: "…that a person close to me (family, friends) would be infected…", Cronbach's α = .86; distant others: "…that someone in Germany would be infected…", Cronbach's α = .73).

Attitudes towards anti-Coronavirus measures. We intended to examine attitudes towards certain goods and interests that are generally conflicting with the anti-Coronavirus measures. Containing the Coronavirus was typically associated with restrictions that affect both the individual level as well as the society as a whole. For example, to protect the health of vulnerable groups, individual mobility had to be restricted in certain periods of time. Here, the underlying conflict relates to higher protection from the Coronavirus versus individual freedom of movement. We developed four items using a 12-point polarity profile. Each item consisted of two conflicting reasons regarding the anti-coronavirus measures (e.g., "individual interests vs. interests of society as a whole" or "public health vs. economic

performance of Germany"). Participants were asked to indicate which aspescts should be more important in the future, if protective measures against the spread of COVID-19 had to be decided again.

Contact tracing app acceptance. At the time of data collection, a newly developed contact tracing app ("Corona-Warn-App") by the Robert Koch Institute (i.e., the central scientific institution of the German government in the field of biomedicine) was about to be introduced. Therefore, participants had to indicate their acceptance of such a solution using six items (7-point-scale, 1 = totally disagree to 7 = totally agree; e.g., "I would install an app for contact tracing on my smartphone"), capturing acceptance as well as perceived usefulness (Cronbach's α = .93).

Self-esteem. Self-esteem was examined with a single item measurement developed by Robins et al. (2001) on 7-point scale (1 = totally disagree to 7 = totally agree; "I have high self-esteem") translated into German.

Collective narcissism. Collective narcissism was measured with the 3-item scale (7-point scale, 1 = totally disagree to 7 = totally agree; e.g., "Not many people seem to fully understand the importance of Germans", Cronbach's α = .80) from Golec de Zavala et al. (2009).

Dark triad personality traits. Dark triad personality traits were assessed using the Naughty Nine questionnaire (Küfner et al., 2015), which is a German psychometrically optimized version of the Dirty Dozen using a 9-point scale from 1 = strongly disagree to 9 = strongly agree (Jonason & Webster, 2010). The three subscales were measured with three items, respectively (*narcissism*, e.g. "I tend to want others to admire me", Cronbach's α = .87; *Machiavellianism*, e.g. "I have used flattery to get my way", Cronbach's α = .79; and *psychopathy*, e.g. "I tend to lack remorse", Cronbach's α = .56).

Individualism and collectivism. We used the German version (Schmerge, 2014) of the Individualism and Collectivism Scale (Triandis & Gelfand, 1998) to measure individualism and collectivism. The German version captures four dimensions with 16 items on a 9-point scale (1 = never or definitely no to 9 = always or definitely yes): *vertical collectivism* (e.g., "Family members should stick together, no matter what sacrifices are required", Cronbach's α = .72), *vertical individualism* (e.g., "It is important that I do my job better than others", Cronbach's α = .74), *horizontal collectivism* (e.g., "To me, pleasure is spending time with others", Cronbach's α = .81), and *horizontal individualism* (e.g., "I'd rather depend on myself than others", Cronbach's α = .82).

Political attitude. Political attitude was measured with the single item scale Left-Right Self-Placement (Breyer, 2015), used in the German Longitudinal Election Study. Participants had to choose their political orientation on a 11-point scale (1 = very left to 11 = very right).

Subjective Social Status. We used the German version (van Bavel et al., 2022) of the MacArthur Scale of Subjective Social Status (Adler et al., 2000) to assess perceived social status. Participants were asked to place themselves on a drawing of a ladder with ten rungs according to the following description: "Think of this ladder as representing where people stand in our society. At the top of the ladder are the people who are the best off, those who have the most money, most education, and best jobs. At the bottom are the people who are the worst off, those who have me least money, least education, and worst jobs or no job".

We measured a set of socio-demographic variables. Participants were asked to report their age, gender, occupational status (e.g., full-time/part-time), average working hours per month, and the extent of their short-time work. In addition, we assessed their household size, the number of children of school age under their care, area of living (first two digits of zip code), and financial worries due to COVID-19. In addition, participants had to indicate their level of formal education in terms of German educational achievement levels (ranging from no educational attainment at all to a university degree).

2.6 QUALITY CONTROL

We used six attention-check items to ensure conscientious participation. These questions either addressed very unlikely situations (e.g., "Aliens have landed in front of my house in the past") or specific response behavior (e.g., "Please select the answer alternative 'rather not agree' here"). These attention check items were presented between the regular items of the psychological measures and beliefs in conspiracy theories (item 1: Dark Triad; item 2: collective narcissim; items 3 and 4: individualism/collectivism; item 5 and 6: FICS; detailed information about the exact position of the attention check items can be found in the codebook).

Furthermore, the processing time was recorded as an additional measure for quality assessment. Thus, participants with very fast processing times could be excluded from further analysis (see for example Berger and Kiefer (2021) for a comparison of different response time outlier exclusion methods). The published dataset still includes the full sample, i.e. no participants have been exluded so far.

2.7 DATA ANONYMIZATION AND ETHICAL ISSUES

Data collection was in accordance with the ethical standards of the Institute of Organizational Psychology at the FOM university ("low-risk research") and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from every participant. Participants were informed about the study's objectives and assured that all sensitive information would be removed once the data were accessed for analysis. Thus, the dataset is fully anonymous.

2.8 EXISTING USE OF DATA

The data have not been used in any publication to date.

(3) DATASET DESCRIPTION AND ACCESS

3.1 DATA PREPROCESSING

The dataset was downloaded from the online survey platform SosciSurvey and pre-processed. First, all variable names were renamed according to their meaning. Second, columns without any data that have been created automatically by SosciSurvey were removed. Third, the individual participation code to grant course credit was deleted. The preprocessed data was renamed with the postfix "_complete".

3.2 FILE NAMES

In total, there are five files in the OSF repository:

1. One data file (data_complete.csv) containing all the data.
2. One codebook (Codebook.xlsx) providing all relevant information to analyze the data. The codebook contains the names of all columns in the dataset and the description or wording of all items. In addition, the value range, the scales, labels of all items, and the scoring rules for each dimension are described. All codes are available in German (as in the survey) and English.
3. One R script (R Script.R) providing the code for calculating the measures' psychometric properties and dimensions.
4. One pdf file (Study Design.pdf) describing the study design and potential hypotheses to analyze the data.
5. One pdf file (Items.pdf) containing all items both in German and English.

3.3 DATA TYPE

Self-report online questionnaire data from 746 participants.

3.4 FORMAT NAMES AND VERSIONS

Data is stored in CSV format, the codebook in XLSX format, the R script in R format, the study design and the items file are in pdf format; the preregistration can be found online in the repository (https://osf.io/b6azp).

3.5 LANGUAGE

The online survey was conducted in German. The codebook also includes the English adaption of the questionnaire.

3.6 REPOSITORY LOCATION

All materials are openly available in the Open Science Framework at: https://osf.io/p6q7w/.

3.7 LICENSE

The data have been deposited under a Creative Commons Attribution 4.0 International (CC BY 4.0) License.

(4) REUSE POTENTIAL

The COVID-19 pandemic is an unprecedented public health emergency of international concern. Considering psychological factors influencing people's protective behavior is central to containing the virus. Corresponding findings can help to design evidence-based measures so that acceptance among the population is as high as possible (Van Bavel et al., 2020). In this context, people's beliefs in conspiracy theories are highly relevant (van Mulukom et al., 2022). Recent studies report that people who believe in or are confronted with a COVID-19 conspiracy theory had lower trust in institutions and lower support for governmental regulations (Pummerer et al., 2022). Also, vaccinations intentions can be negatively affected (Yang et al., 2021).

The presented dataset addresses various antecedents to beliefs in conspiracy theories about COVID-19 and can therefore contribute to a better understanding of COVID-19 related conspiracy theories in Germany. Compared to other datasets that are available and related to the topic (e.g., the COVID-19 Snapshot Monitoring, COSMO by Betsch et al. (2020)), the presented dataset focuses more extensively on beliefs in conspiracy theories about COVID-19 and various antecedents using two different and well-established measures. In addition, this dataset provides information on the acceptance and use of a contact tracing app (CTA), as well as certain attitudes towards anti-Coronavirus measures. Here, research on the associations between perception of CTAs and conspiracy theories is still scarce, especially for Germany. In one study, no association was reported between belief in conspiracy theories and CTAs when a categorical measure of conspiracy theories (yes/no/maybe/do not know) was used (Kostka & Habich-Sobiegalla, 2022). However, in a second wave of the same study, positive associations were found when a Likert scale was used. Thus, the presented dataset of this study could be used to better understand this aspect and any possible associations. It has not yet been used for hypothesis testing, nor was it published elsewhere. Thus, the data provide several opportunities for further use. First, a comparison can be made with existing research on conspiracy theories to determine whether well-established factors that determine beliefs in conspiracy theories are also relevant in the context of COVID-19. In addition, data and results from other countries regarding

beliefs in COVID-19 conspiracy theories (e.g., Alper et al., 2021; Tonković et al., 2021; Vezzoni et al., 2022; Azevedo et al., 2022) can be compared with this German dataset. Second, this dataset can be used to examine whether changes in the measured variables occur over time. Previous studies have shown that reactions to the pandemic and adherence to guidelines in Germany have changed over the last two years. For example, trust in official statistics was associated with adherence to social distancing guidelines in 2021 but not in 2020 (Lermer et al., 2021). It would be beneficial to investigate whether similar effects can also be demonstrated for beliefs in conspiracy theories. Accordingly, the dataset could provide a benchmark for future studies. Third, the dataset could be used to check for different groups or patterns regarding the antecedents can be identified. Previous research has found that different segments of the general public can be distinguished depending on laypersons' agreement with technical claims about the spread of COVID-19 (Rothmund et al., 2020). Thus, the dataset could be analyzed using methods such as structural equation modelling (e.g., latent class analysis) to better understand what groups of people believe in conspiracy theories.

Finally, some limitations of the dataset must be mentioned. The dataset comprises a non-representative sample and is limited to Germany, as it only includes participants residing in Germany. Thus, certain socio-demographic factors might differ compared to other European countries, which should be taken into account when making comparisons with other studies. Also, the sample was recruited through a university online pool. However, since courses at this university are designed to combine study and work, most of the participants worked at least part-time with an average of over 30 hours per week, which clearly distinguishes the dataset from classic student samples.

COMPETING INTERESTS

The authors have no competing interests to declare.

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