Pre-registration

The conspiracy hoax? Testing key hypotheses about the correlates of generic beliefs in conspiracy theories during the COVID-19 pandemic

Martin Bruder[1], Laura Kunert[1], Philipp Schmid[2], Lisa Felgendreff[2], Cornelia Betsch[2]

[1]German Institute for Development Evaluation (DEval), Bonn, Germany

[2]University of Erfurt, Germany

Abstract

Conspiracy beliefs seem a highly relevant phenomenon in the context of the COVID-19 pandemic as indicated, for example, by social media influencers regularly referring to or promoting conspiracy theories. At the same time, the COVID-19 pandemic provides a unique opportunity to test hypotheses concerning correlates of generic beliefs in conspiracy theories. For this study, we identified four key hypotheses from the extant literature concerning both the predictors and possible outcomes of generic beliefs in conspiracy theories. Specifically, we plan to examine whether generic beliefs in conspiracy theories are correlated with (1) level of education, (2) trust in media, public health institutions, the government, and science, (3) fears and worries and (4) preventive behavior using OLS regression models.

Introduction

Conspiracy beliefs are a highly relevant phenomenon in the context of the COVID-19 pandemic (see Fisher, 2020). For example, the conspiracy theory linking 5G networks to COVID-19 (Ahmed et al., 2020) and the one blaming Bill Gates for its spread have received considerable attention in social media (Shahsavari et al., 2020) – but have also been taken to the streets in the context of anti-lockdown demonstrations. At the same time, the COVID-19 pandemic provides a unique opportunity to test hypotheses concerning correlates of the generic propensity to endorse conspiracy beliefs. In this study, we identified four key hypotheses from the extant literature concerning both the predictors and possible outcomes of generic beliefs in conspiracy theories. In addition, we will conduct initial analyses testing, whether the data are consistent with a model predicting that deleterious effects of conspiracy beliefs on preventive behavior are mediated by trust in government. The goal of the study therefore is three-fold: First, we want to help inform the response to the COVID-19 pandemic by highlighting possible predictors and outcomes of generic beliefs in conspiracy theories in this context. Second, we want to contribute to the literature on conspiracy beliefs by testing key hypotheses on the correlates of generic beliefs in conspiracy theories in a highly relevant real-life setting. This helps to address possible shortcomings of previous experimental and correlational research that sometimes made use of settings that may be of less immediate personal relevance to the respondents and therefore may provide lower levels of ecological validity. Third, we want to extend the existing literature on the relationship between conspiracy beliefs, trust, and preventive behavior given the high significance for policy-making in times of the COVID-19 pandemic.

Literature review and hypotheses

The four key correlational hypotheses concerning generic beliefs in conspiracy theories tested in this article are the following:

First, previous research has found that generic beliefs in conspiracy theories are negatively associated with education level (van Prooijen, 2017).

Second, there is some evidence for a negative correlation between generic beliefs in conspiracy theories and trust with some emerging evidence even in the context of the COVID-19 pandemic (Rieger & Wang, 2020). In particular, high levels of generic beliefs in conspiracy theories have been found to predict lower levels of trust in media (Stempel et al., 2007) and state-funded institutions (Invernizzi & Mohamed, 2019). In addition, we explore the role of conspiracy beliefs in trust in science. Einstein and Glick (2015) further found that exposure to specific conspiracy theories is associated with lower levels of trust in government.

Third, generic beliefs in conspiracy theories have been found to be associated with higher levels of paranoia (Imhoff & Lamberty, 2018). In this study, both health-related fears and worries and economic fears and worries in the context of the pandemic will be tested.

Fourth, generic beliefs in conspiracy theories predict lower levels of compliance with recommendations by official authorities (e.g., in the context of vaccination; Jolley and Douglas, 2014). Recent research observed that different types of specific conspiracy beliefs about the COVID-19 pandemic are correlated with distinct preventive behavior (Imhoff & Lamberty, 2020). In the context of the COVID-19 pandemic, we further explore whether different types of preventive behaviors are differentially predicted by generic beliefs in conspiracy theories. In particular, we differentiate two types of preventive behavior: (a) hygiene-related behaviors such as not touching the face, use of sanitizer, cover coughing, wearing masks or hand-washing and (b) contact-related behaviors such as avoiding handshakes, social distancing, avoiding crowds and refraining from travelling.[1] Given the lack of specific predications that can be derived from the literature, we test the two hypotheses in parallel and explore possible differences in effect sizes for the two types of preventive behaviors.

In addition, we will, fifth, explore whether possible effects of generic beliefs in conspiracy theories on preventive behaviors can be explained by changes in trust in government. We expect higher levels of conspiracy beliefs to reduce trust in government (see Hypothesis 2d) and this in return lead to a reduction in preventive behavior. Given the cross-sectional nature of the data, we will only be able to test whether the correlational data are consistent with such a mediation model – leaving further substantiating the causal sequence to future research in the course of the pandemic.

Specifically, based on the theorizing described above, the following hypotheses will be tested:

Hypothesis 1: Higher levels of education predict lower levels of generic beliefs in conspiracy theories.

Hypothesis 2a: Higher levels of generic beliefs in conspiracy theories predict lower levels of trust in media.

Hypothesis 2b: Higher levels of generic beliefs in conspiracy theories predict lower levels of trust in the German health care system at the local level.

Hypothesis 2c: Higher levels of generic beliefs in conspiracy theories predict lower levels of trust in (public) health organizations.

Hypothesis 2d: Higher levels of generic beliefs in conspiracy theories predict lower levels of trust in government.

Hypothesis 2e (exploratory): Higher levels of generic beliefs in conspiracy theories predict lower levels of trust in science.

Hypothesis 3a: Higher levels of health-related fears and worries predict higher levels of generic beliefs in conspiracy theories.

Hypothesis 3b: Higher levels of economic fears and worries predict higher levels of generic beliefs in conspiracy theories.

---

[1] For a detailed list of the variables, please refer to Table 1.

Hypothesis 4a: Higher levels of generic beliefs in conspiracy theories predict less engagement in hygiene-related preventive behavior.

Hypothesis 4b: Higher levels of generic beliefs in conspiracy theories predict less engagement in contact-related preventive behavior.

Hypothesis 5: Possible effects of generic beliefs in conspiracy theories are mediated by changes in trust in government.

Data and research design

We use data from the 11th wave of the COVID-19 Snapshot Monitoring (COSMO) survey collected between Mai 12 and 13, 2020 (see Betsch et al., 2020). The dataset is a stratified online sample drawn from an online pool of the company respondi with 1,014 respondents representative of the German population with respect to gender and age (crossed) and federal state (not crossed).

The following two tables list the main constructs/variables (Table 1) and the control variables (Table 2) to be used for testing the above hypotheses.

Table 1: Constructs based on COSMO wave 11

Construct measured	Item text	Scale
Generic beliefs in conspiracy theories	I think that many very important things happen in the world, which the public is never informed about.	1 (certainly not) – 7 (likely certain)
	I think that politicians usually do not tell us the true motives for their decisions.	1 (certainly not) – 7 (likely certain)
	I think that government agencies closely monitor all citizens.	1 (certainly not) – 7 (likely certain)
	I think that events, which superficially seem to lack a connection, are often the result of secret activities.	1 (certainly not) – 7 (likely certain)
	I think that there are secret organizations that greatly influence political decisions.	1 (certainly not) – 7 (likely certain)
Education	How many years of education have you completed?	1 (0-9 years) 2 (at least 10 years without higher education entrance qualification) 3 (at least 10 years with higher education entrance qualification)
Trust in media	(Introduction: How much trust do you have in the below mentioned individuals and organizations that they can handle the coronavirus well?) Media	1 (very little trust) – 7 (a lot of trust)
Trust in the German health care system	Doctor	1 (very little trust) – 7 (a lot of trust)
	Hospitals	1 (very little trust) – 7 (a lot of trust)
	Local Health Department	1 (very little trust) –

Trust in (public) health organizations		7 (a lot of trust)
	Ministry of Health of the State	1 (very little trust) – 7 (a lot of trust)
	Federal Ministry of Health	1 (very little trust) – 7 (a lot of trust)
	Robert Koch Institute	1 (very little trust) – 7 (a lot of trust)
	Federal Centre for Health Education	1 (very little trust) – 7 (a lot of trust)
	World Health Organization	1 (very little trust) – 7 (a lot of trust)
Trust in government	Federal Government	1 (very little trust) – 7 (a lot of trust)
Trust in science	Science	1 (very little trust) – 7 (a lot of trust)
Health-related fears and worries	(Introduction: Due to the current corona situation, how much do you worry…)	
	…to lose somebody you love?	1 (don't worry at all) – 7 (worry a lot)
Economic fears and worries	… that an economic recession occurs?	1 (don't worry at all) – 7 (worry a lot)
	… to lose your job?	1 (don't worry at all) – 7 (worry a lot)
Hygiene-related preventive behavior	(Introduction: How often have you followed the following recommendations to avoid an infection with the coronavirus within the last week?)	
	Avoid touching the face	1 (never), 2 (rarely), 3 (sometimes), 4 (often), 5 (always)
	Use of sanitizer	1 (never), 2 (rarely), 3 (sometimes), 4 (often), 5 (always)
	Cover coughing	1 (never), 2 (rarely), 3 (sometimes), 4 (often), 5 (always)
	Use of face mask	1 (never), 2 (rarely), 3 (sometimes), 4 (often), 5 (always)
	Hand washing	1 (never), 2 (rarely), 3 (sometimes), 4 (often), 5 (always)
Contact-related preventive behavior	Avoid handshakes	1 (never), 2 (rarely), 3 (sometimes), 4 (often), 5 (always)
	Social distancing (1.50 meters space)	1 (never), 2 (rarely), 3 (sometimes), 4 (often), 5 (always)
	Avoid crowds	1 (never), 2 (rarely), 3 (sometimes), 4 (often), 5 (always)
	Meet people of another household in public	1 (never), 2 (rarely), 3 (sometimes), 4 (often), 5 (always)
	Do only necessary ways	1 (never), 2 (rarely), 3 (sometimes), 4 (often), 5 (always)
	Not seeing friends and relatives	1 (never), 2 (rarely), 3 (sometimes), 4 (often), 5 (always)

	Avoid private journeys	1 (never), 2 (rarely), 3 (sometimes), 4 (often), 5 (always)

Table 2: Control variables based on COSMO wave 11

Variable	Item text	Scale
Age	How old are you?	I am ___ years old.
Gender	What is your gender?	1 (male), 2 (female)
Inhabitants	How many inhabitants live in the village or town in which you live?	1 (≤ 5,000 inhabitants), 2 (5,001 - 20,000 inhabitants), 3 (20,001 - 100,000 inhabitants), 4 (100,001 - 500,000 inhabitants), 5 (> 500,000 inhabitants)
Federal state*	In which state in Germany do you live?	1 (Baden-Württemberg) … 16 (Thüringen)

Note: *Federal state of residency will be included into the regression analyses as dummy variables.

We will conduct the following preliminary analyses:

Generic beliefs in conspiracy theories: We will conduct an exploratory factor analysis to explore the factor structure of the five generic conspiracy belief items. If a one-factor solution emerges (which should be the case given the previous literature (Bruder et al., 2013)), we will use the predicted factor scores for all further analyses.

Trust in individuals and organizations related to health care: We will conduct a principal component analysis to explore the factor structure of all items related to the trust of individuals and organizations. Given unrelated analyses in other waves of the COSMO survey, we expect a two-factor solution with trust in the local doctor and hospitals loading on one factor (trust in health care system at the local level) and trust in (public) health care organizations (such as national institutes or the World Health Organization) loading on another factor. If a two factor-solution emerges, we will consider the predicted factor scores for all further analysis.

Health-related preventive behavior: We will conduct a principal component analysis to explore the factor structure of the five items on health-related preventive behavior. If a one-factor solution emerges, we will consider the predicted factor scores for all further analysis.

Contact-related preventive behavior: We will conduct a principal component analysis to explore the factor structure of the seven items on contact-related preventive behavior. If a one-factor solution emerges, we will consider the predicted factor scores for all further analysis.

Regression analyses

Hypothesis 1: An OLS regression will be used to test whether education level (dummy-coded) predicts levels of generic beliefs in conspiracy theories. The regression model will include the control variables listed in Table 2.

Hypotheses 2a-2e: An OLS regression will be used to test whether higher levels of generic beliefs in conspiracy theories predict lower levels of trust in media, the government, the German health care system, (public) health organizations, and science, respectively. The regression models will include the control variables listed in Table 2.

Hypotheses 3a-3b: An OLS regression will be used to test whether higher levels of health-related and economic fears and worries predict lower levels of generic conspiracy belief, respectively. The regression models will include the control variables listed in Table 2.

Hypotheses 4a-4b: An OLS regression will be used to test whether higher levels of generic beliefs in conspiracy theories predict less engagement in hygiene-related preventive behavior and contact-related preventive behavior, respectively. The regression models will include the control variables listed in Table 2.

Hypothesis 5: A SEM-based mediation analysis will be conducted to test whether possible effects of generic beliefs in conspiracy theories on preventive behavior can be explained by indirect effect through trust in government.

Power calculation

The regression analyses contain 1 predictor and 3 control variables each. Using an online power calculator[2] reveals that in order to detect a small effect of f^2 = .02 with a power of β > .80 at α = .05 requires a sample of N > 601 (see Figure below). The study therefore is very well powered and some care needs to be taken to include effect size in the interpretation of the effects. Significant effects smaller than f^2 = .02 are unlikely to have substantial real-life significance and will be interpreted such.

Power Chart (n=602)
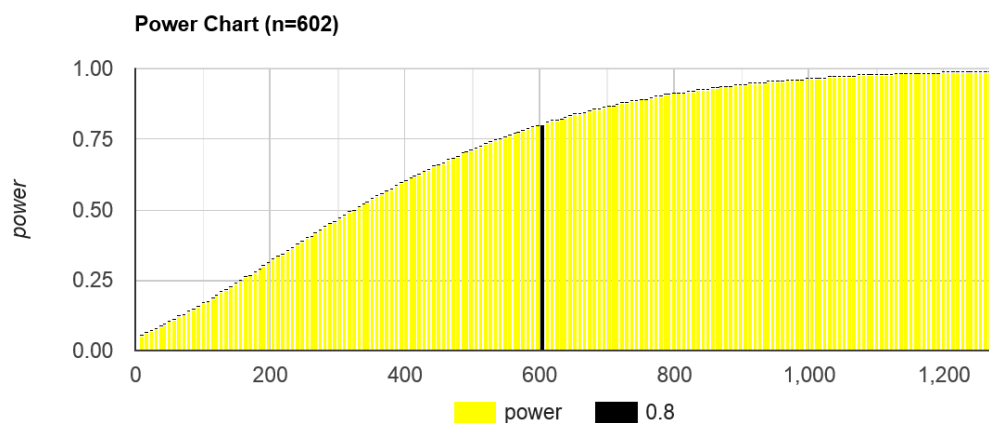
Literature

Ahmed, W., Vidal-Aiaball, J., Downing, J., & López Seguí, F. (2020). COVID-19 and the 5G Conspiracy Theory: Social Network Analysis of Twitter Data. *Journal of Medical Internet Research*, *22*(5), e19458. https://doi.org/10.2196/19458

Betsch, C., Wieler, L. H., & Habersaat, K. (2020). Monitoring behavioural insights related to COVID-19. *The Lancet*, *395*(10232), 1255–1256. https://doi.org/10.1016/S0140-6736(20)30729-7

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*. https://doi.org/10.3389/fpsyg.2013.00225

Einstein, K. L., & Glick, D. M. (2015). Do I Think BLS Data are BS? The Consequences of Conspiracy Theories. *Political Behavior*, *37*(3), 679–701. https://doi.org/10.1007/s11109-014-9287-z

---

[2] *http://www.statskingdom.com/sample_size_regression.html*

Fisher, M. (2020, April 8). *Why Coronavirus Conspiracy Theories Flourish. And Why it Matters*. The New York Times. https://www.nytimes.com/2020/04/08/world/europe/coronavirus-conspiracy-theories.html

Imhoff, R., & Lamberty, P. (2018). How paranoid are conspiracy believers? Toward a more fine-grained understanding of the connect and disconnect between paranoia and belief in conspiracy theories. *European Journal of Social Psychology*, *48*(7), 909–926. https://doi.org/10.1002/ejsp.2494

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* [Preprint]. PsyArXiv. https://doi.org/10.31234/osf.io/ye3ma

Invernizzi, G. M., & Mohamed, A. E. (2019). Trust Nobody: How Conspiracy Theories Can Distort Political Accountability. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3507190

Jolley, D., & Douglas, K. M. (2014). The Effects of Anti-Vaccine Conspiracy Theories on Vaccination Intentions. *PLoS ONE*, *9*(2), e89177. https://doi.org/10.1371/journal.pone.0089177

Rieger, M. O., & Wang, M. (2020). *Trust in Government Actions during the COVID-19 Crisis*. https://www.uni-trier.de/fileadmin/fb4/prof/BWL/FIN/Files/Trust_in_Government_Actions_during_the_COVID-19_Crisis.pdf

Shahsavari, S., Holur, P., Tangherlini, T. R., & Roychowdhury, V. (2020). Conspiracy in the Time of Corona: Automatic detection of Covid-19 Conspiracy Theories in Social Media and the News. *arXiv:2004.13783 [cs]*. http://arxiv.org/abs/2004.13783

Stempel, C., Hargrove, T., & Stempel, G. H. (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

van Prooijen, J.-W. (2017). Why Education Predicts Decreased Belief in Conspiracy Theories: Education and Conspiracy Beliefs. *Applied Cognitive Psychology*, *31*(1), 50–58. https://doi.org/10.1002/acp.3301