

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

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Short Title

Generic beliefs in conspiracy theories during a pandemic

Author Note

The content is unrelated to evaluation activities at the German Institute for Development Evaluation (DEval).

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Abstract

Conspiracy beliefs are ubiquitous in the current COVID-19 pandemic. This may be because they directly affect own and others' health and economic outcomes due to detrimental effects on preventive behaviour. We aimed to (a) test key hypotheses on the correlates of generic beliefs in conspiracy theories in this high-threat real-life setting, (b) examine the role of trust in mediating effects of conspiracy beliefs on preventive behaviour, and (c) thereby inform the public health response. Using cross-sectional data ($N=1,013$) from the German COVID-19 monitoring we tested the relationships between conspiracy beliefs and (a) social and economic worries, (b) trust in media, the government, public health institutions, and science, and (c) hygiene-related and contact-related preventive behaviour. Results were in line with expectations apart from null findings for the relationships with social worries and hygiene-related preventive behaviour. Trust in government mediated effects of conspiracy beliefs on contact-related preventive behaviour.

Keywords: coronavirus pandemic, conspiracy ideation, public health messaging, social distancing, government trust

Introduction

Conspiracy beliefs thrive when individuals are under threat (van Prooijen, 2020) and societies are in crisis (van Prooijen & Douglas, 2017). Indeed, during the COVID-19 pandemic the salience of conspiracy beliefs in public discourse is high – as are endorsement rates (Freeman et al., 2020). Given the substantial levels of health, economic and socio-political threat that many countries and individuals experience, the global COVID-19 pandemic provides a powerful context to re-examine some key findings on correlates of conspiracy beliefs. We formulated specific hypotheses for three aspects of particular relevance.

First, generic beliefs in conspiracy theories are predicted by fear induced in laboratory settings (Grzesiak-Feldman, 2013). In fact, countering feelings of existential threat may be a key motivation for entertaining conspiracy beliefs – although they may ultimately be ineffective in achieving this goal (van Prooijen, 2020). Initial findings indeed point to a correlation between COVID-19 related fears and generic conspiracy beliefs in Serbian and Latin-American convenience samples (Jovančević & Milićević, 2020). We specifically tested both social (Hypothesis 1a) and economic (Hypothesis 1b) COVID-19 related fears as possible correlates of generic beliefs in conspiracy theories using a sample representative of the German population in key demographics.

Second, there is some evidence for a negative correlation between generic beliefs in conspiracy theories and trust (Hypothesis 2; Goertzel, 1994; see Stojanov & Halberstadt, 2019 for the role of skepticism in this association). In particular, high levels of conspiracy beliefs predict lower levels of trust in media (Hypothesis 2a; Stempel et al., 2007). We also investigated trust in government (Hypothesis 2b; Einstein & Glick, 2015), trust in public health institutions (Hypothesis 2c), trust in the German health care system at the local level (Hypothesis 2d), and trust in science (Hypothesis 2e; Lewandowsky et al., 2015). All are highly relevant for an adaptive response to the COVID-19 pandemic as well as of theoretical relevance – to date differences in the association of conspiracy beliefs with different types of

trust have not received much attention in general and in the COVID-19 pandemic in particular.

Jovančević and Milićević (2020) provide initial evidence of a negative association between a generic “trust in people” scale and conspiracy beliefs in the context of the pandemic.

Third, generic beliefs in conspiracy theories predict lower levels of compliance with guidelines by official authorities (Marinthe et al., 2020) and conspiracy beliefs may reduce vaccination intentions (Jolley and Douglas, 2014). Recent research revealed that different types of specific conspiracy beliefs about COVID-19 are correlated with distinct patterns of preventive behaviour (Imhoff & Lamberty, 2020). We aim to add to this literature by exploring whether types of preventive behaviours are differentially predicted by generic beliefs in conspiracy theories. In particular, we distinguish hygiene-related behaviours (Hypothesis 3a) from contact-related behaviours (Hypothesis 3b) expecting stronger effects for the latter because contact-related behaviours might have more profound implications for daily life and social relationships thereby eliciting stronger responses.

Albeit existing research on conspiracy theories offers relevant evidence that allows for well-founded hypotheses on all of these questions, much of this work has been conducted in laboratory settings with samples drawn from student populations. Thus, threat-levels and motives to endorse conspiracy theories may have been comparatively low (Douglas et al., 2017). Testing the ecological validity of previous findings in a real-life high-threat setting therefore can help to ascertain reproducibility of associations of generic conspiracy beliefs across different settings and establish possible contextual boundary conditions of previously observed correlations.

One aspect of conspiracy beliefs that may be particular in the context of a pandemic is their immediate relevance not only for those who entertain these beliefs, but also for others who do not. Whereas in many situations believing in conspiracy theories may have little direct effect on others, not following recommended preventive behaviours may directly impact the further course of the pandemic – and thereby the health and economic outcomes of everyone in society. In fact, the link between

COVID-19 conspiracy beliefs and not engaging in preventive behaviour (such as social distancing; Bierwiazzonek et al., 2020) has become the very core of substantial political controversy. Better understanding the predictors and outcomes of conspiracy beliefs in the context of the pandemic therefore is of high theoretical as well as practical and political relevance. For this purpose, understanding possible mediating mechanisms is important.

Therefore – in addition to testing the correlational hypotheses outlined above – we also explored whether possible effects of generic beliefs in conspiracy theories on preventive behaviours could be explained by changes in trust in government. This relationship is of particular relevance in the context of the pandemic because building and maintaining trust is a major task for politicians and public health institutions in particular. Initial evidence is consistent with an indirect effect of conspiracy beliefs on preventive behaviour through trust in government (Pavela Banai et al., 2020). We expected higher levels of conspiracy beliefs to be associated with lower levels of trust in government and this, in turn, to be correlated with lower levels of compliance with prescribed and recommended preventive behaviours (Hypothesis 4).

Method

Participants and design

We used data from the 11th wave of the German national COVID-19 Snapshot Monitoring (COSMO) survey collected between May 12 und 13, 2020 (Betsch et al., 2020). The stratified cross-sectional online sample was representative of the German adult population with respect to gender and age (crossed) as well as federal state (not crossed) and consisted of 1,013 participants (521 women, 492 men, $M_{age} = 46.29$, $SD_{age} = 15.56$).

Measures

Generic beliefs in conspiracy theories were measured using the five-item Conspiracy Mentality Questionnaire (Bruder et al., 2013) with item endpoints ranging from *certainly not true* (1) to *certainly*

true (7). Example items are “I think that many very important things happen in the world, which the public is never informed about” and “I think that there are secret organizations that greatly influence political decisions”. An exploratory factor analysis suggested a one-factor solution (KMO = 0.84, Bartlett’s test: $\chi^2(10) = 2590.560$, $p < 0.001$) explaining 67% of variance. We used the extracted factor score for all further analyses.

Social fears and worries were assessed by asking whether participants worried to lose somebody they loved during the pandemic (7-point scale ranging from *very few worries* to *a lot of worries*). Two items measured *economic fears and worries* (using the same scale): worry to lose your job and worry that an economic recession occurs.

Trust in media, different public health actors, the government, and science was measured using a 7-point scale ranging from *very little trust* to *a lot of trust*. A principal component analysis of eight items assessing trust in professionals and institutions related to health care suggested a two-factor solution after promax rotation accounting for 77% of the variance. The first factor represented trust in public health institutions (trust in the local health department, the ministry of health of the state, the Federal Ministry of Health, the Robert Koch Institute, the Federal Centre for Health Education, and the World Health Organization) whereas the second factor had high loadings of two items concerning trust in the German health care system at a local level (trust in doctors and trust in hospitals).

Participants reported on their *preventive behaviour* concerning 12 recommendations by public authorities (rated from *never* (1) to *always* (5)). Five items represented hygiene-related behaviour (avoid touching the face, use of sanitizer, cover coughing, use of face mask, hand-washing). A principal component analysis was consistent with a one-factor solution (50% of variance explained). We used extracted factor scores for all further analyses. The other seven items measured contact-related preventive behaviour (avoid handshakes, social distancing, avoid crowds, moving in public with people from one other household, only go outside when necessary, do not meet with friends and relatives,

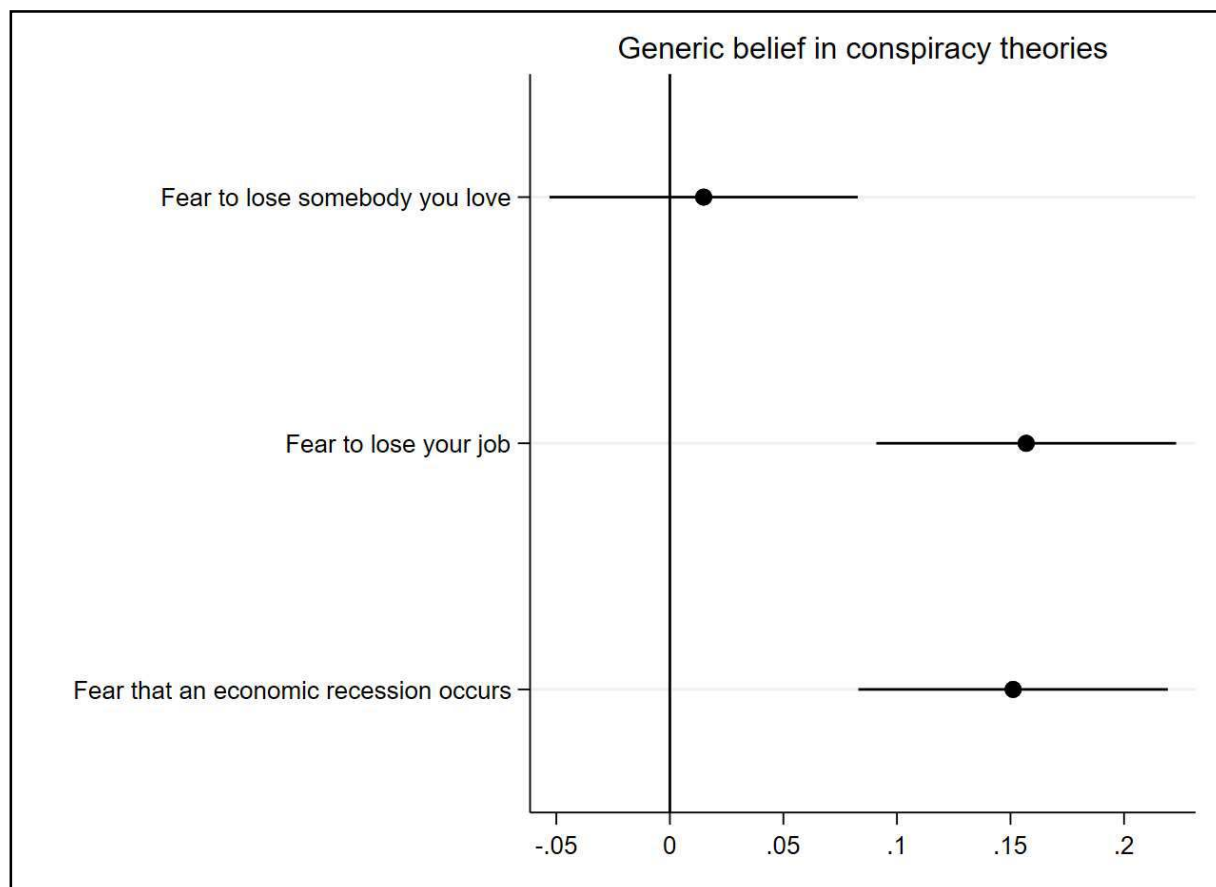
avoid private journeys). A principal component analysis explained 51% of variance. We again used extracted factor scores for further analyses. Due to the important conceptual and political distinction between the two types of preventive behaviours, we retained the two distinct scales despite a high correlation between them ($r = .73, p < .001$).

Results

We conducted OLS regressions¹ with standardized beta coefficients and robust standard errors to test Hypotheses 1 to 3. Each hypothesis was tested with and without the following control variables: age, gender, community size (5 categories ranging from $\leq 5,000$ inhabitants to $>500,000$ inhabitants) and federal state fixed effects. Below, regressions including control variables are reported^{2,3}.

Correlation between Covid-19 related fears and generic beliefs in conspiracy theories

Inconsistent with Hypothesis 1a, social fears and worries were not significantly linked to generic beliefs in conspiracy theories, $\beta=0.015$, $\eta^2<.001$, $SE=0.034$, $p=.667$. However, both items on economic fears and worries predicted generic beliefs in conspiracy theories (Hypothesis 1b): worry to lose your job, $\beta=0.157$, $\eta^2=.023$, $SE=0.034$, $p<.001$, and worry that an economic recession occurs, $\beta=0.151$, $\eta^2=.023$, $SE=0.035$, $p<.001$ (see Figure 1).

Figure 1*Plotted regression results for Hypotheses 1a and 1b***Correlation between generic beliefs in conspiracy theories and trust**

Results showed that trust in media (Hypothesis 2a) is negatively associated with generic beliefs in conspiracy theories, $\beta=-0.372$, $\eta^2=.137$, $SE=0.031$, $p<.001$. Further, generic beliefs in conspiracy theories are negatively associated with trust in government, $\beta=-0.479$, $\eta^2=.231$, $SE=0.028$, $p<.001$ (Hypothesis 2b). Among all hypotheses related to trust, generic beliefs in conspiracy theories has the strongest association with trust in public health institutions, $\beta=-0.510$, $\eta^2=.257$, $SE=0.033$, $p<.001$ (Hypothesis 2c). A smaller but still significant negative association exists between generic beliefs in conspiracy theories and trust in the German health care system, $\beta=-0.270$, $\eta^2=.074$, $SE=0.037$, $p<.001$.

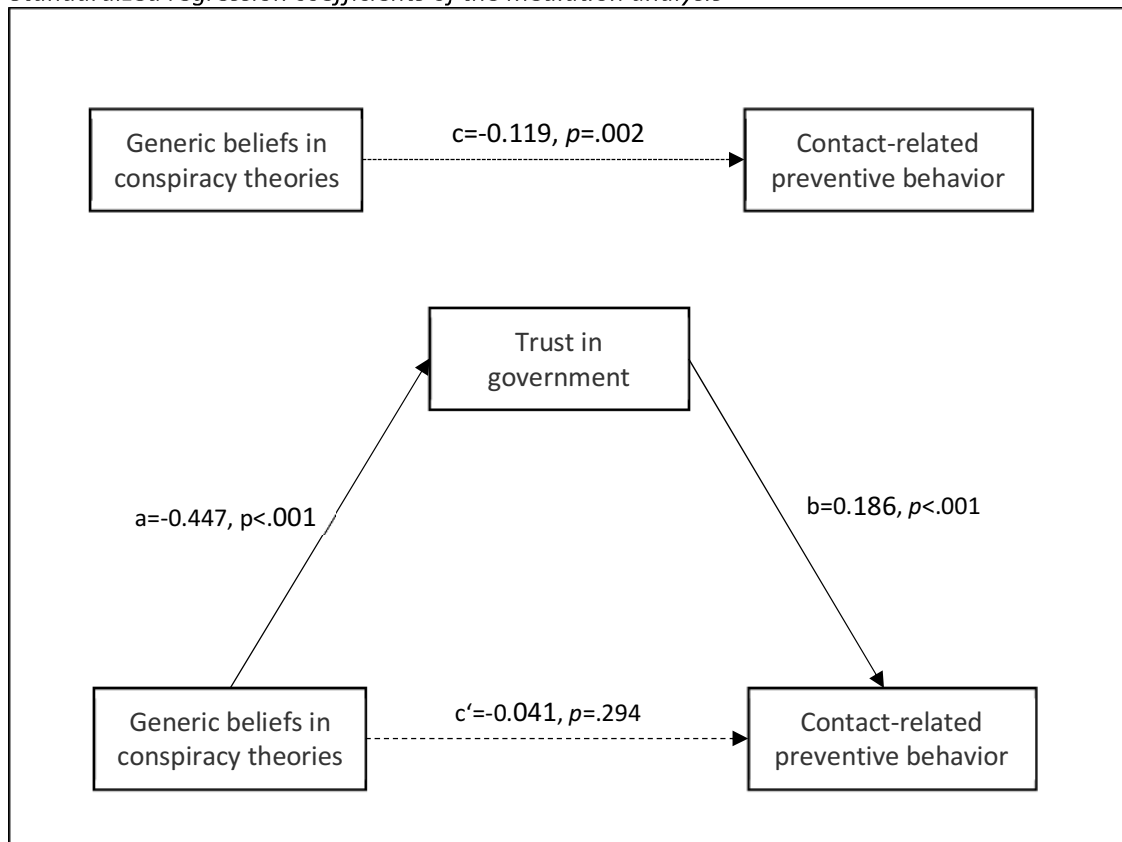
(Hypothesis 2d). Finally, results revealed a negative relationship between generic beliefs in conspiracy theories and trust in science, $\beta=-0.415$, $\eta^2=.173$, $SE=0.032$, $p<.001$ (Hypothesis 2e).

Correlation between generic beliefs in conspiracy theories and preventive behaviour

There was no significant link between generic beliefs in conspiracy theories and hygiene-related preventive behaviour, $\beta=-0.054$, $\eta^2=.003$, $SE=0.034$, $p=.112$ (Hypothesis 3a). In line with Hypothesis 3b, generic beliefs in conspiracy theories negatively predicted contact-related preventive behaviour, $\beta=-0.119$, $\eta^2=.015$, $SE=0.038$, $p=.002$.

Mediating role of trust in government

Given the results of Hypotheses 3a and 3b, the mediating role of trust in government was examined for the relationship between generic beliefs in conspiracy theories and contact-related preventive behaviour only. As Figure 2 illustrates, the direct effect between generic beliefs in conspiracy theories and contact-related preventive behaviour is reduced to non-significance when controlling for trust, $\beta=-0.041$, $SE=0.039$, $p=.294$. Instead, the SEM model showed that generic beliefs in conspiracy theories were indirectly linked to contact-related preventive behaviour via trust in government as a mediator, $\beta=-0.083$, $SE=0.020$, $p<.001$ (Hypothesis 4). The pattern of results is consistent with full mediation according to Baron and Kenny (1986).

Figure 2*Standardized regression coefficients of the mediation analysis*

Note. Dashed lines indicate non-significant relationships; solid lines indicate significant relationships at $\alpha = .05$.

Discussion

We tested three key correlational hypotheses concerning predictors and outcomes of generic beliefs in conspiracy theories in the context of the ongoing pandemic. We also aimed to inform public health interventions.

Interestingly, the personal fear of losing a loved person did not predict higher levels of conspiracy beliefs – but both personal and more general economic worries did. Decisive political action to minimize individuals' fear of a strong economic impact of the pandemic on their economic circumstances may be one important type of intervention to reduce the prevalence of conspiracy beliefs in the further course of the pandemic.

Generic beliefs in conspiracy theories predicted trust with medium (media, health care at the local level) to large (government, public health institutions, science) negative effect sizes. The somewhat lower effect size for trust in media seems surprising given that conspiracy believers often reject mainstream media in particular. However, the items in this study did not differentiate between mainstream and alternative (social) media. Further, cross-national research as well as more differentiated assessment of different media outlets can help to identify whether effect sizes are smaller in Germany compared to other countries or whether trust in specific media is more strongly associated with conspiracy beliefs. The strong correlation between conspiracy beliefs and trust in government, public health institutions, and science may provide hints that a focus on addressing conspiracy theories with factual statements may be a crucial component in gaining trust among some parts of the population. However, such communication may need to occur before encountering the respective conspiracy theories and may be ineffective at a later stage (Jolley & Douglas, 2017), which makes this a challenging endeavour.

Finally, preventive behaviour is not negatively associated with generic beliefs in conspiracy theories across the board. In particular, we did not observe an association between conspiracy beliefs and relatively low-level hygiene-related preventive behaviours such as hand-washing or covering one's mouth when coughing. In the German context this also includes mask wearing which has not been as politicized in the broader public (the ferocious opposition of smaller groups notwithstanding) as it may have been in the US or Brazil. In contrast, there was a small but significant effect of generic beliefs in conspiracy theories on contact-related such as social distancing. Given the very substantial effects of non-compliance of even a relatively small group on the health and economic outcomes of everyone, this effect warranted further examination.

A mediation analysis revealed that the correlational pattern of the association between generic beliefs in conspiracy theories and contact-related preventive behaviour was consistent with a mediation

of this association by trust in government. Focusing on retaining or regaining the trust of all parts of the population should therefore be a major focus of government action – not only to avoid a dysfunctional level of polarization of the public discourse, but also to keep the population safe and healthy during public health emergencies.

One limitation of the present study lies in its sole use of generic measures of conspiracy beliefs rather than specific COVID-19 related items. Also, this cross-sectional study – as a lot of other research on conspiracy beliefs – is limited with respect to any possible causal claims. Future research will have to establish possible divergent patterns for specific conspiracy beliefs in the pandemic context and ascertain the causal pathways. Testing key correlational hypotheses of generic conspiracy beliefs during the COVID-19 pandemic therefore constitutes just one step in meeting a formidable scientific and political challenge.

¹ The Bonferroni-adjusted alpha level is .017 (.05/3) for Hypotheses 1a and 1b (two tests for 1b), .01 (.05/5) for Hypotheses 2a-2e, and .025 (.05/2) for Hypotheses 3a and 3b.

² Some of the measures contain missing values, which reduced sample sizes. See regression tables in the supplementary material for details.

³ Hypotheses 1-3 were also tested with participants' level of education as additional control variable. This did not affect the results in any substantial way (i.e., significance levels were identical, effect sizes were of the same order of magnitude).

Ethical Compliance Section

Funding: The authors have no funding to disclose.

Compliance with Ethical Standards: We exclusively used secondary data from the COSMO project (<http://dx.doi.org/10.23668/psycharchives.2776>). All procedures performed in the COSMO studies involving human participants were in accordance with the ethical standards of the University of Erfurt institutional research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Conflict of Interest: The authors declare they have no conflict of interest.

Informed consent: Informed consent was obtained from all individual participants included in the study.

Only adults were eligible as participants.

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Supplementary Material**Table 1***Test of Hypothesis 1a: OLS regression analysis on social fears and worries (and controls) predicting generic beliefs in conspiracy theories*

Variables	Generic beliefs in conspiracy theories					
	Model 1			Model 2		
	β	p	95% CI	β	p	95% CI
Fear to lose somebody you love	0.020	.559	[-0.047, 0.087]	0.015	.667	[-0.053, 0.083]
Age				-0.053	.086	[-0.114, 0.008]
Gender				0.040	.209	[-0.023, 0.103]
Community size				-0.049	.177	[-0.121, 0.022]
State FE	No			Yes		
R ²	0.000			0.025		

Note. N=1,013. FE=Fixed Effects.**Table 2***Test of Hypothesis 1b: OLS regression analysis on job-related economic fears and worries (and controls) predicting generic beliefs in conspiracy theories*

Variables	Generic beliefs in conspiracy theories					
	Model 1			Model 2		
	β	p	95% CI	β	p	95% CI
Fear to lose your job	0.157	.000	[0.093, 0.220]	0.157	.000	[0.091, 0.223]
Age				-0.024	.463	[-0.088, 0.040]
Gender				0.040	.204	[-0.022, 0.103]
Community size				-0.062	.090	[-0.134, 0.010]
State FE	No			Yes		
R ²	.024			.049		

Note. N=983. FE=Fixed Effects.

Table 3

Test of Hypothesis 1b: OLS regression analysis on recession-related economic fears and worries (and controls) predicting generic beliefs in conspiracy theories

Variables	Generic beliefs in conspiracy theories					
	Model 1			Model 2		
	β	p	95% CI	β	p	95% CI
Fear that an economic recession occurs	0.150	.000	[0.083, 0.218]	0.151	.000	[0.083, 0.219]
Age				-0.066	.032	[-0.127, -0.006]
Gender				0.035	.266	[-0.026, 0.096]
Community size				-0.047	.196	[-0.118, 0.024]
State FE	No			Yes		
R ²	.023			.047		

Note. N=1,013. FE=Fixed Effects.

Table 4

Test of Hypothesis 2a: OLS regression analysis on generic beliefs in conspiracy theories (and controls) predicting trust in media

Variables	Trust in media					
	Model 1			Model 2		
	β	p	95% CI	β	p	95% CI
Generic beliefs in conspiracy theories	-0.376	.000	[-0.436, -0.316]	-0.372	.000	[-0.433, -0.311]
Age				0.076	.012	[0.016, 0.135]
Gender				0.055	.065	[-0.003, 0.144]
Community size				0.047	.185	[-0.022, 0.115]
State FE	No			Yes		
R ²	.141			.157		

Note. N=985. FE=Fixed Effects.

Table 5*Test of Hypothesis 2b: OLS regression analysis on generic beliefs in conspiracy theories (and controls) predicting trust in government*

Variables	Trust in government					
	Model 1			Model 2		
	β	<i>p</i>	95% CI	β	<i>p</i>	95% CI
Generic beliefs in conspiracy theories	-0.477	.000	[-0.532, -0.422]	-0.479	.000	[-0.534, -0.424]
Age				0.025	.384	[-0.032, 0.082]
Gender				0.058	.041	[0.002, 0.113]
Community size				0.060	.070	[-0.005, 0.125]
State FE	No			Yes		
R ²	.229			.249		

Note. N=986. FE=Fixed Effects.**Table 6***Test of Hypothesis 2c: OLS regression analysis on generic beliefs in conspiracy theories (and controls) predicting trust in (public) health institutions*

Variables	Trust in (public) health institutions					
	Model 1			Model 2		
	β	<i>p</i>	95% CI	β	<i>p</i>	95% CI
Generic beliefs in conspiracy theories	-0.502	.000	[-0.566, -0.439]	-0.510	.000	[-0.574, -0.445]
Age				-0.023	.463	[-0.086, 0.039]
Gender				0.075	.016	[0.014, 0.136]
Community size				0.058	.106	[-0.012, 0.127]
State FE	No			Yes		
R ²	.253			.273		

Note. N=795. FE=Fixed Effects.

Table 7

Test of Hypothesis 2d: OLS regression analysis on generic beliefs in conspiracy theories (and controls) predicting trust in the German health care system at the local level

Variables	Trust in the German health care system at the local level					
	Model 1			Model 2		
	β	p	95% CI	β	p	95% CI
Generic beliefs in conspiracy theories	-0.279	.000	[-0.350, -0.209]	-0.270	.000	[-0.342, -0.198]
Age				0.154	.000	[0.087, 0.221]
Gender				-0.012	.723	[-0.079, 0.055]
Community size				0.073	.058	[-0.002, 0.149]
State FE	No			Yes		
R ²	.078			.119		

Note. N=795. FE=Fixed Effects.

Table 8

Test of Hypothesis 2e: OLS regression analysis on generic beliefs in conspiracy theories (and controls) predicting trust in science

Variables	Trust in science					
	Model 1			Model 2		
	β	p	95% CI	β	p	95% CI
Generic beliefs in conspiracy theories	-0.410	.000	[-0.472, -0.347]	-0.415	.000	[-0.478, -0.352]
Age				-0.029	.337	[-0.088, 0.030]
Gender				0.004	.885	[-0.053, 0.062]
Community size				0.061	.060	[-0.003, 0.125]
State FE	No			Yes		
R ²	.170			.191		

Note. N=973. FE=Fixed Effects.

Table 9

Test of Hypothesis 3a: OLS regression analysis on generic beliefs in conspiracy theories (and controls) predicting hygiene-related preventive behaviour

Variables	Hygiene-related preventive behaviour					
	Model 1			Model 2		
	β	p	95% CI	β	p	95% CI
Generic beliefs in conspiracy theories	-0.050	.137	[-0.115, 0.016]	-0.054	.112	[-0.120, 0.013]
Age				0.174	.000	[0.111, 0.236]
Gender				0.236	.000	[0.170, 0.301]
Community size				0.054	.160	[-0.021, 0.129]
State FE	No			Yes		
R ²	.002			.097		

Note. N=873. FE=Fixed Effects.

Table 10

Test of Hypothesis 3b: OLS regression analysis on generic beliefs in conspiracy theories (and controls) predicting contact-related preventive behaviour

Variables	Contact-related preventive behaviour					
	Model 1			Model 2		
	β	p	95% CI	β	p	95% CI
Generic belief in conspiracy theories	-0.117	.002	[-0.191, -0.043]	-0.119	.002	[-0.194, -0.044]
Age				0.232	.000	[0.165, 0.300]
Gender				0.200	.000	[0.132, 0.267]
Community size				0.022	.580	[-0.055, 0.098]
State FE	No			Yes		
R ²	.013			.128		

Note. N=753. FE=Fixed Effects.