

“COVID-19: PSYCHOLOGICAL CHALLENGES”

COVID-19: Belief in Conspiracy Theories and the Need for Quarantine

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Background. Situations that are characterized by unexpected scenarios, unpredictable developments, and risks to life and health facilitate beliefs in conspiracy theories. These beliefs — together with reliable information, intentional and unintentional misinformation and rumors — determine attitudes toward the situations and ways to overcome them.

Objective. To examine the effect of belief in conspiracy theories on the recognition of the need for quarantine during the COVID-19 pandemic; the effect of personality traits on belief in conspiracy theories and on the recognition of the need for quarantine; the relationship of belief in conspiracy theories with assessment of the dangers of COVID-19 and with feelings of hopelessness.

Design. The study was conducted over a period when the number of coronavirus cases was growing, during the first three weeks of the lockdown in Russia. The sample included 667 undergraduate and graduate students aged 16–31 ($M = 20.44$, $SD = 2.38$); 74.2% of the participants were women. Respondents filled out two online questionnaires. The first related to perceptions about the COVID-19 pandemic; the second was a brief HEXACO inventory.

Results. Belief in Conspiracy Theories accounts for 13% of variance in Recognition of the Need for Quarantine; together with Dangers of COVID-19 and Hopelessness, conspiracy beliefs account for more than a quarter of the variance. Personality traits defined in the context of the 6-factor personality model have a small effect on conspiracy beliefs about the coronavirus and on perception of the need for quarantine.

Conclusion. Belief in conspiracy theories is associated not only with irrational views of reality, but also with the adoption of ineffective behaviors.

Keywords:
COVID-19,
conspiracy theories,
quarantine, dangers
of the coronavirus,
hopelessness,
HEXACO

Introduction

Conspiracy theories are viewed as attempts to explain various social phenomena as the result of conspiracies by certain powerful groups that are exceptionally effective and no less exceptionally malicious (Douglas & Sutton, 2018). It is assumed (van Prooijen & van Vugt, 2018) that conspiracy theories are always based on a perceived causal relationship between events, a conviction that certain people act deliberately to carry out their secret plans, and a certainty that there exists a group of people who work together to develop their conspiratorial plans and to bring them to life. In addition, conspiracies always presume elements of danger and secrecy.

Conspiracy beliefs are fueled by a deficit of information and/or a lack of ability to obtain reliable information, which happens all the time, particularly in extraordinary circumstances: Information is often contradictory or may be deliberately obscured or too difficult to comprehend (Sunstein & Vermeule, 2009). The lack of information gives rise to another source of conspiracy theories: uncertainty. Changes in the familiar context of events, uncertainty about how a situation will develop, helplessness — all of this requires a quick response. Even though conspiracy theories are related to the oversimplification of a problem and the distortion of information, in a complex situation they serve an adaptive function: They quickly provide an explanation for confusing and threatening events. This creates the illusion of control over the situation, maintains self-esteem, reduces anxiety, and can restore (albeit not always) a level of activity that makes it possible to deal with problems (Hofstadter, 1966). At the same time, the accessibility and reliability of information and certainty about a situation do not guarantee that conspiracy theories will not emerge.

Three mutually related approaches to studying conspiracy theories and their origins can be highlighted in psychology: (a) analyzing conspiracy theories as a manifestation of psychopathology, (b) identifying personality traits and cognitive characteristics that can increase a predisposition to conspiracy beliefs, and (c) looking at the determinants of conspiracy theories from the point of view of social psychology.

(a) A manifestation of psychopathology. From the earliest research into conspiracy theories (Hofstadter, 1966), it was posited that they were associated with a tendency toward paranoid ideation. Empirical studies with a normal population confirmed the hypothesized relationship with paranoid ideation and demonstrated an association with schizotypy. Thus, conspiracies were shown to be associated with paranoid ideation, delusion-proneness, and schizotypy (Barron, Morgan, Towell, Altemeyer, & Swami, 2014; Brotherton & Eser, 2015; Bruder, Haffke, Neave, Nouripanah, & Imhoff, 2013; Darwin, Neave, & Holmes, 2011; Georgiou, Delfabbro, & Balzan, 2019; Hart & Graeter, 2018). Comparative analysis of two groups — conspiracist website visitors and students who agreed to participate in the study — demonstrated more pronounced conspiracy theories for the group of conspiracist website visitors. No differences were found in schizotypy between the groups; however, respondents with the highest schizotypy scores had much higher levels of conspiracy mentality (van der Tempel & Alcock, 2015). An investigation of conspiracy beliefs and the influence of maladaptive traits (25 PID-5 facets) on conspiracy beliefs showed that two facets — Suspiciousness and, to a greater de-

gree, Unusual Beliefs and Experiences — were significant predictors of conspiracy theories (Swami, Weis, Lay, Barron, & Furnham, 2016b).

The only study that compared emotional problems and conspiracy theories about the origin of COVID-19 showed a correlation between emotional problems and supernatural beliefs about the origin of the coronavirus (Somma et al., 2020).

b) Research into the personality correlates of belief in conspiracy theories began in the 1990s and already then showed that conspiracy beliefs are associated with low levels of trust and high levels of anomie (Goertzel, 1994). Low levels of trust together with an external locus of control and hostility are also associated with perceptions of the existence of conspiracies (Abalakina-Paap, Stephan, Craig, & Gregory, 1999) and with low trust in government services and institutions (Einstein & Glick, 2015). The link with anomie was confirmed later (e.g., Bruder et al., 2013).

Stronger conspiracy beliefs are associated with higher levels of powerlessness (Abalakina-Paap et al., 1999; Bruder et al., 2013; Jolley & Douglas, 2014) and lower levels of control (van Prooijen & Acker, 2015). Correlations were found between conspiracy theories and authoritarianism (Abalakina-Paap et al., 1999; Bruder et al., 2013; Wood & Gray, 2019), personal efficacy (Bruder et al., 2013), and belief in a dangerous world (Hart & Graeter, 2018).

In studying predictors of conspiracy beliefs, it would be logical to suppose that the most basic personality traits (Big Five) create a predisposition for conspiracy beliefs. Some confirmation of this supposition was found (Bruder et al., 2013; Swami et al., 2011; Swami & Furnham, 2012). However, the results of a meta-analysis based on random-effects models were disappointing: None of the Big Five traits exhibited a correlation with conspiracy theories if effect sizes were aggregated (Goreis & Voracek, 2019).

Since conspiracy theories become particularly popular in crisis situations, research into emotional states — fear, anxiety, stress — can play a special role in personality research into conspiracy theories. For example, it has been demonstrated that higher anxiety results in reduced analytic thinking and thus lower critical thinking about conspiracy theories (Swami, Voracek, Stieger, Tran, & Furnham, 2014). At the same time, data on anxiety are mixed: Pre-exam anxiety was shown to be related to conspiracy theories (Grzesiak-Feldman, 2013), while assessments of actual anxiety and anxiety as a personality trait were not (Swami et al., 2016a). The subjective assessment of perceived stress and stressful life events were significant predictors of conspiracy theories, accounting for a small part of their variance (Swami et al., 2016a).

Two studies conducted during the COVID-19 pandemic (Georgiou, Delfabbro, & Balzan, 2020, in press; Jovanchevic & Milićević, 2020, in press) had results that corresponded to those obtained in calmer times. Thus, conspiracy theories related to the coronavirus turned out to be closely related to other conspiracy theories, but did not show links with perceived stress, even though these associations were expected to be closer than in calmer times. The authors of the first study posit that the results may reflect the fact that a large part of the sample was in self-isolation and felt safe, experiencing boredom rather than stress (Georgiou et al., 2020, in press). The second study used one item to assess belief in conspiracy theories: “The virus was created in the laboratory on purpose.” This item was associated with “trust,” but only in one of the two samples of the study (Jovanchevic & Milićević, 2020, in press).

Cognitive characteristics have been investigated in only a few studies. Their results showed a correlation between conspiracy theories and low intelligence, relatively low levels of education, errors in assessing the probability of events, low analytical thinking, high need for cognitive closure, and well-developed intuition (for example, Georgiou et al., 2019; Leman & Cinnirella, 2013; Marchlewska, Cichocka, & Kossowska, 2017; Swami et al., 2014; van Prooijen, 2017).

Personality trait studies have served an important role in conceptualizing conspiracy beliefs.

First of all, these studies have brought the subject of conspiracy theories beyond the discourse of pathology — latent psychopathology, to use the terminology of Swami et al. (2011) — positing that normal personality traits serve as the antecedents of conspiracy beliefs.

Second, studies of very different conspiracy theories have shown that there are significant correlations between them. If a respondent believes in one conspiracy theory, he or she is much more likely to believe in others, even if some of them contradict each other (Goertzel, 1994; Swami et al., 2011). This made it possible to talk about separating out a constellation of conspiracy theories (conspiracist ideation) and also demonstrated that conspiracy theories are “monological” — i.e., attitudes toward new events are regulated by the way in which they fit in with pre-existing conspiracy theories. Nevertheless, there are cases when conspiracy beliefs lead to different, even opposite, behaviors (Imhoff & Lamberty, 2020).

(c) Social-psychological studies of conspiracy theories have only been conducted for several years. They actively assimilate the factology of other research directions, introduce new subject matter related to social cognition and motivation, and look at conspiracy theories as a result of everyday cognitive processes (Douglass, Sutton, & Cichocka, 2017; Douglas & Sutton, 2018).

A key objective of social-psychological studies is to understand what purpose conspiracy theories serve, what motivations they satisfy for those who believe in them, and what advantages and disadvantages they offer. To that end, it is useful to consider the motivations of conspiracy theories in the context of a classification borrowed from system-justification theory (Jolley, Douglas, & Sutton, 2018; Jost, Ledgerwood, & Hardin, 2008). This classification includes three perspectives for analysis: epistemic (understanding a situation enough to feel confident), existential (being able to control a situation and feel safe), and social (maintaining one’s image in a group) (Douglas et al., 2017).

Social-psychological studies showcase indicators that are typical of conspiracy theories (Hofstadter, 1966): Simplification and rationalization of reality and the tendency to attribute complex and multifaceted phenomena of social life to the machinations of enemies (Lamberty, Hellmann, & Oeberst, 2018; Pellegrini, Leone, & Giacomantonio, 2019; Sutton & Douglas, 2020). Belief in conspiracy theories emerges when the authorities have low moral authority, particularly under conditions of uncertainty (van Prooijen & Jostmann 2013).

In closing this brief overview, we should highlight a key aspect of conspiracy theory research. All discussions to date have been based on the hypothesis that conspiracy theories are rooted in erroneous premises that served as the foundation for mistaken conclusions. However, the belief that the mighty of the world are involved in a conspiracy could be quite reasonable. A textbook example of this was

Watergate. In this case, being suspicious had nothing to do with schizotypy, and belief in a conspiracy had a proactive rather than defensive nature. Many researchers have insisted on the need to distinguish between the two versions of being suspicious, particularly the researchers who analyzed conspiracy theories from the viewpoint of philosophical epistemology rather than psychology — unfortunately, not now, but in earlier studies (Bale, 2007).

Psychological studies of conspiracy theories recognize that conspiracy theories play a defensive, if not adaptive, role, and they concur that the key situational sources of conspiracy theories are uncertainty, lack of clarity, and danger. This is the very situation created by the COVID-19 pandemic.

The evolution of the pandemic in Russia throughout March 2020 set the stage for recognizing that the country had not escaped the fate that had befallen many other countries close by and far away. While in early March Russian officials had declared that measures taken by the authorities were primarily preventative, by the middle of March the tightening of the measures clearly showed that preventative measures were not sufficient, and that quarantine measures would soon be introduced. In early March there was a proposal to switch schools to distance learning if possible; on March 14, a decree was issued requiring all schools to transition to distance learning; and on March 21, universities were ordered to switch to distance learning. On March 16, events with more than 5,000 participants were prohibited in Moscow; six days later, the permitted number of participants was reduced to 50. On March 27, a public holiday (a soft form of self-isolation) through April 2 was declared in order to slow the spread of the coronavirus; by March 30, the self-isolation was extended to April 12 in Moscow and 31 other regions; on April 2, the self-isolation was extended nationwide until April 30.

All of these measures created an atmosphere that made the emergence of conspiracy beliefs about the coronavirus not just possible, but inevitable. From the very beginning of the pandemic, before any cases of infection were reported in Russia, there were already conspiracy theories circulating online. As cases of COVID-19 appeared and their number increased, at least half of the discussions on the Internet about newspaper articles and radio or TV performances that related at least indirectly to the coronavirus contained various and frequently contradictory conspiracy theories. One of the most popular blames Bill Gates for the pandemic, claiming that it is an excuse to create a vaccine and implant microchips into people along with the vaccine. There are different versions of the theory that offer varying reasons why Bill Gates would want this — for example, to reduce the world population, to gain unlimited access to information about everyone, or to rule all of humanity.

The very fact of the pandemic also sparks mistrust. According to a sociological survey conducted by the Higher School of Economics (Artamonov, 2020), the number of respondents who believe that “there is no and will be no epidemic; it is just a fabrication by interested parties” increased from 11.6% on March 19 to 20.7% on May 12. This is despite the fact that the number of coronavirus infections also increased during this period, from 199 to about 232,000.

Our study investigated whether belief in conspiracy theories affects recognition of the need for quarantine; the association of conspiracy beliefs with assessment of

the danger of COVID-19 and with hopelessness; and the links between conspiracy beliefs and personality traits. The hypotheses of the study were as follows:

H1: Respondents who believe in conspiracy theories deny the danger of COVID-19 and do not support the introduction of quarantine measures.

H2: The associations between conspiracy beliefs and hopelessness are positive. We expect that inability to influence a situation and doubts that infection can be avoided lead to conspiracy beliefs and to denial of the danger of COVID-19.

H3: In the uncertain and unpredictable situation resulting from the COVID-19 pandemic, HEXACO personality traits may serve as predictors of conspiracy beliefs and recognition of the need for quarantine.

Methods

Procedure

The study was conducted online with a sample of undergraduate and graduate students. Professors involved in distance education shared information about the study and forwarded a request from the study organizers to their students. Participants received a link to a website with the questionnaires. The students could choose whether to provide their names or use nicknames. Those who wanted to receive feedback could include their email addresses. Thus, the study was voluntary, and the participants could choose whether it was anonymous.

The data analyzed in this article were collected between March 31 and April 23, 2020. During that time, the number of coronavirus cases in Russia rose from 2,337 to 62,773. The number of infections in the regions where the study participants resided rose from 1,740 to 37,939. *Figure 1* shows the curve of confirmed cases from the date when lockdown measures were introduced in Russia and until their gradual lifting began. The period during which data were collected is also marked on the graph.

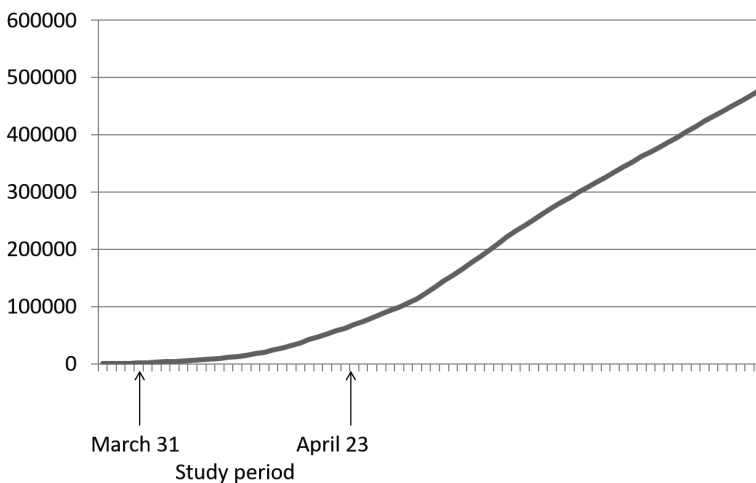


Figure 1. Number of those infected during the lockdown (March 26 — June 7) and during the study period (March 31 — April 23).

The study was completed long before coronavirus infections in Russia peaked. Thus, respondents who filled out questionnaires at the beginning of the study and those who did so at the end were in a similar situation: They were hoping that the rate of infections would soon start slowing, and they were making forecasts based on dynamics in other countries where COVID-19 began to spread a month or two earlier than in Russia. Although the forecasts were not optimistic, depression and demoralization did not stand out as major problems during the period — at least not for students. Naturally, restrictions on social interactions and movement stemming from the quarantine measures had an impact on their moods, but the participants in our sample continued to live a relatively normal life: All of them were still studying (distance learning), and many expected to make good use of the free time they would gain because of the involuntary isolation.

Participants

The sample included 667 participants aged 16–31. The mean age was 20.44 (standard deviation of 2.38). All participants were college students (undergraduate and graduate) with different majors, including mathematics, physics, biology, medicine, psychology, jurisprudence, sociology, philology, and journalism. The ratio of women to men was 74.2% to 25.8%. The prevalence of women in our sample is typical for online surveys.

The participants' regions of residence included Moscow and Moscow District, St. Petersburg, Nizhny Novgorod, Krasnodar Krai, and a number of cities in the Volga region (total of 15 locations). Four of these cities have had the highest rates of infection in the country throughout the pandemic.

Measures

COVID-19 Questionnaire

The respondents' perceptions of the dangers of COVID-19 and the social situation resulting from the spread of the coronavirus were assessed using a 22-item questionnaire developed by the authors. When designing the questionnaire, we posited that some of the items would form four scales: Danger, Belief in Conspiracy Theories, Recognition of the Need for Quarantine, and Hopelessness. When the items were factorized (principal component factor analysis, Varimax rotation), this hypothesis was confirmed. In addition to these four scales, items were selected based on a factor obtained through a single-factor solution to comprise a fifth scale: Denial of Danger (Egorova, Parshikova, Zyryanova, & Staroverov, in press).

The Conspiracy Beliefs scale includes 4 items, such as “*There is no pandemic, we are being deceived by those who profit from creating panic and bringing down the world economy.*” According to expert analysis, the scale is associated with a tendency to seek out enemies who either greatly exaggerate the dangers of the coronavirus or have completely fabricated the pandemic due to some ulterior motives. The factor associated with conspiracy beliefs accounts for 14% of variance. The internal consistency of the scale (Cronbach's alpha) is 0.72.

The Danger of COVID-19 scale includes 3 items, such as “*I think that the coronavirus really is very dangerous.*” Expert analysis associates the scale with the un-

derstanding of the contagiousness of the SARS-CoV-2 virus, the severe forms of the disease, and the high death rate. The factor associated with the Danger of COVID-19 accounts for 13% of variance. The internal consistency of the scale (Cronbach's alpha) is 0.73.

The Recognition of the Need for Quarantine scale includes 3 items, such as “*I view the introduction of strict quarantine measures to prevent the spread of the coronavirus as completely justified.*” The factor associated with Recognition of the Need for Quarantine accounts for 12% of variance. The internal consistency of the scale (Cronbach's alpha) is 0.57.

The Hopelessness scale includes 3 items, such as “*Almost everyone will become infected and get sick, it is only a matter of time.*” According to expert analysis, Hopelessness reflects a sense of helplessness and the conviction that efforts aimed at reducing the risk of infection are pointless. A good example of hopelessness is a phrase that became popular at the beginning of the pandemic, the original author of which is not known: “We thought this was a planet of people, but it's a planet of viruses.” The factor associated with Hopelessness accounts for 8% of variance. The internal consistency of the scale (Cronbach's alpha) is 0.42.

The Denial of danger scale includes all items from the questionnaire that had factor loadings of over 0.5 in a single-factor solution downplaying the dangers of the coronavirus (“*It is no worse than the flu*”), denying the existence of the pandemic, unwillingness to recognize the need for preventative measures, and highlighting their negative consequences (“*The economic consequences of quarantine are more dangerous than the coronavirus*”). The internal consistency of the 10-item scale is 0.78.

Two other items from the questionnaire, which are not included in the scales, are used in describing the results: “*No one knows the real number of coronavirus cases in Russia, because we do not have large-scale testing of the population*” and “*Our country is better prepared than other countries to fight the epidemic.*”

When filling out the questionnaire, respondents rated their agreement-disagreement with its statements on a 5-point Likert scale.

Brief HEXACO Inventory

A short version of the Russian adaptation of the HEXACO-PI-R inventory (Egorova, Parshikova, & Mitina, 2019) was used to assess personality traits. The inventory has 24 items, 4 for each personality trait, and makes it possible to assess 6 factor-level traits.

Honesty/Humility — high scores reflect candidness, reluctance to stand out by demonstrating one's status or material advantages, distaste for deceit regardless of the chances of being caught, and disinclination to manipulate others or act falsely for personal gain.

Emotionality — manifested as a tendency to worry with or without reason, to fear injury and illness, to seek support from others, and to express empathy toward others.

Extraversion — high scores are associated with sociability, energy, high self-esteem, and ability to influence others.

Agreeableness — readiness to understand others and pay attention to their opinions. Individuals with high Agreeableness scores are rarely irritated and angered by others, forgive offenses easily, and are not prone to criticize or harshly judge those around them.

Conscientiousness — exhibited as diligence, a desire for order, caution and forethought in making decisions, and the ability to work hard to achieve one's goals.

Openness to Experience — high scores are associated with curiosity, a good imagination, a love of the arts and literature, interest in all things unusual, and creativity.

Respondents rated their agreement-disagreement with the statements of the inventory on a 5-point Likert scale.

Social and Demographic Characteristics

When filling out the questionnaires, respondents provided their age, gender, birth order, current region of residence, educational institution, and field of study.

Results

Descriptive Statistics and Correlation of Conspiracy Belief Indicators

Descriptive statistics for items related to belief in conspiracy theories and for the five questionnaire scales are presented in *Table 1*. Average responses for the four items of the questionnaire related to a conspiratorial view of the coronavirus are skewed toward the negative side (i.e., the majority of participants are skeptical about conspiracy theories). Significant gender differences were identified for only one scale: Recognition of the Need for Quarantine. Women were more likely to support the use of quarantine measures.

All items from the Belief in Conspiracy Theories scale have a negative correlation with the Danger of COVID-19 scale and the Recognition of the Need for Quarantine scale, which is reasonable: A quarantine does not make sense if the coronavirus is no more dangerous than the flu or if it's just someone's malicious fabrication. The Hopelessness scale has a positive correlation with the Belief in Conspiracy Theories scale, which does not seem logical, at least at first glance: Why would respondents agree that "almost everyone will get infected and get sick" if they do not consider the coronavirus dangerous?

The Hopelessness scale is associated with not feeling sufficiently informed. This is evidenced by the positive correlation between the scale and the questionnaire item that states "*No one knows the real number of coronavirus cases in Russia, because we do not have large-scale testing of the population*" ($r = .13, p = .001$), whereas the Belief in Conspiracy Theories scale has correlations with insufficient information ($r = .11, p = .003$) and a negative association with lack of trust in the readiness of government institutions to combat the COVID-19 epidemic ("*Our country is better prepared than other countries to fight the epidemic*" ($r = -.11, p = .004$)).

Table 1

Means, standard deviations, gender differences, and correlation (Spearman's rho)

Items of the scale Belief in Conspiracy Theories and all scales	M (SD)			t f vs m	Items of the scale Belief in Conspiracy Theories			
	All	Female	Male		1	2	3	4
Items								
1. The hysteria surrounding the coronavirus is being fueled to distract attention from other national problems.	2.88 (1.38)	2.94 (1.36)	2.73 (1.42)	ns	1.00	.39**	.26**	.43**
2. There is no pandemic; we are being deceived by those who profit from creating panic and bringing down the world economy.	1.49 (0.90)	1.53 (0.90)	1.38 (0.92)	ns		1.00	.50**	.37**
3. The new virus is a conspiracy by pharmaceutical companies that want to make money on it.	1.26 (0.61)	1.25 (0.57)	1.27 (0.73)	ns			1.00	.28**
4. The authorities are using the pandemic to isolate the country and restrict the rights and freedoms of its citizens.	2.06 (1.26)	2.02 (1.24)	2.19 (1.34)	ns				1.00
Scales								
Belief in Conspiracy Theories	1.92 (0.78)	1.93 (0.75)	1.89 (0.85)	ns	.84**	.62**	.49**	.77**
Danger of COVID-19	3.50 (0.99)	3.67 (0.97)	3.57 (1.03)	ns	-.45**	-.42**	-.21**	-.27**
Denial of Danger	2.32 (0.75)	2.20 (0.73)	2.29 (0.82)	ns	.76**	.59**	.41**	.61**
Need for Quarantine	3.74 (0.85)	3.67 (0.83)	3.60 (0.91)	2.41*	-.27**	-.21**	-.06	-.28**
Hopelessness	2.81 (0.87)	2.67 (0.87)	2.78 (0.88)	ns	.31**	.22**	.11**	.24**

Note. N = 667, * p < .01, ** p < .001

Belief in Conspiracy Theories and Personality Traits

The personality traits examined in relation to belief in conspiracy theories included the factor-level traits of the 6-factor HEXACO model of personality: Honesty/Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience.

Mean Differences. Responses to items related to belief in conspiracy theories that fell in the middle range of values were excluded. The mean values for personality traits were calculated for participants who received high and low scores

on the Belief in Conspiracy Theories scale (i.e., those in the outermost groups), and the differences in means of personality traits were assessed (Table 2). Since the suitability of the parametric criterion for comparing extreme groups can be called into question, the differences of means were compared using not only Student's *t*-criterion but also the non-parametric Mann-Whitney Z criterion. When using parametric and non-parametric criteria, the differences of means fully coincided: Significant differences were identified between the same personality traits.

Table 2

Personality traits with significant differences in outermost groups (high-low Belief in Conspiracy Theories)

Belief in Conspiracy Theories	Personality Traits	Responses*		t-criterion	Mann-Whitney Z
		Yes	No		
1. The hysteria surrounding the coronavirus is being fueled to distract attention from other national problems.	Honesty/Humility	3.33	3.51	-2.51, p=012	-2.380 p=.017
	Extraversion	3.11	2.84	3.28, p=.001	-3.294 p=.001
2. There is no pandemic; we are being deceived by those who profit from creating panic and bringing down the world economy.	Honesty/Humility	2.86	3.46	-4.18, p=.000	-3.477 p=.001
3. The new virus is a conspiracy by pharmaceutical companies that want to make money on it.	Honesty/Humility	2.08	3.45	-5.35, p=.000	-4.110 p=.000
	Emotionality	2.83	3.59	-2.91, p=.004	-2.230 p=.026
	Openness to Experience	3.10	3.86	-2.96, p=.003	-2.820 p=.005
4. The authorities are using the pandemic to isolate the country and restrict the rights and freedoms of its citizens.	Honesty/Humility	3.22	3.47	-2.67, p=.008	-2.443 p=.015
	Conscientiousness	3.25	3.51	-2.92, p=.004	-2.839 p=.005
Overall Scale	Honesty/Humility	2.96	3.48	-4.43, p=.000	-3.697 p=.000

Note. *Means of personality traits for respondents who did and did not agree with this item of the questionnaire.

The results indicate, first of all, that Honesty/Humility plays a special role (there are differences related to this personality trait both for the overall scale and for all items of the scale), and, second, that all six personality traits are involved to some degree. Belief in conspiracy theories is exhibited most frequently by those with higher Extraversion scores and lower scores for all other personality traits.

Correlation Analysis. All items from the Belief in Conspiracy Theories scale exhibit low but significant negative correlations with Honesty/Humility, and three of the four exhibit positive correlations with Extraversion. The value of the correlations is not above .15. The Belief in Conspiracy Theories scale has significant correlations with Honesty/Humility ($r = -.11, p < .01$) and Extraversion ($r = .09, p < .03$).

Regression Analysis. Multiple regressions were conducted to determine the effect of personality traits on conspiracy beliefs and related attitudes toward COVID-19. In all cases, the predictors were the personality traits and the dependent variables were (a) Belief in Conspiracy Theories, (b) Denial of Danger, (c) Hopelessness, and (d) Recognition of the Need for Quarantine. All models were significant ($p < .001$).

- a) Personality traits predicted 3.1% of variance in the Belief in Conspiracy Theories and the only significant predictor was Honesty/Humility ($b = -.16, p < .001$): The higher the Honesty/Humility, the lower the Belief in Conspiracy Theories.
- b) Significant predictors of the Denial of Danger were Honesty/Humility ($b = -.14, p < .001$) and Extraversion ($b = .10, p < .01$); all personality traits together accounted for 3.6% of variance.
- c) Personality traits account for 2.8% of variance in the Hopelessness scale. There are significant correlations between Hopelessness and two personality traits — Agreeableness ($b = -.09, p < .02$) and Conscientiousness ($b = -.11, p < .001$): The lower the Agreeableness and Conscientiousness scores, the greater the sense of helplessness and vulnerability evoked by the pandemic.
- d) Individual differences in personality traits are even less closely associated with attitudes toward the introduction of quarantine; these accounted for 2.0% of variance. Significant predictors of Recognition of the Need for Quarantine were Emotionality ($b = .13, p < .002$) and Conscientiousness ($b = .11, p < .008$): The higher the scores for these traits, the greater the support for quarantine measures.

Mediation Analysis. The Danger of COVID-19 scale was used as the independent variable in the mediation analysis. Its direct and indirect effects on Belief in Conspiracy Theories were assessed. The correlation of the Danger of COVID-19 scale and the Belief in Conspiracy Theories scale is equal to $-.41, p < 0.001$. The correlations of the Danger of COVID-19 scale and four items of Belief in Conspiracy Theories are presented in Table 1 ($r_s = -.21 — -.45, p < .001$). Honesty/Humility was the mediator in analysis of the relations between the scales.

The results obtained are presented in *Figure 2*. Data show that for the Belief in Conspiracy Theories scale (model d) and for three of the four items of the scale (models a–c) the effect of the perception of the Danger of the Coronavirus on Belief in Conspiracy Theories is mediated by Honesty/Humility. All of the models were precisely determined and therefore the chi-square for each model is equal to zero. All coefficients and mediated effects are statistically significant ($p < 0.05$), but the effect sizes are negligible in all cases.

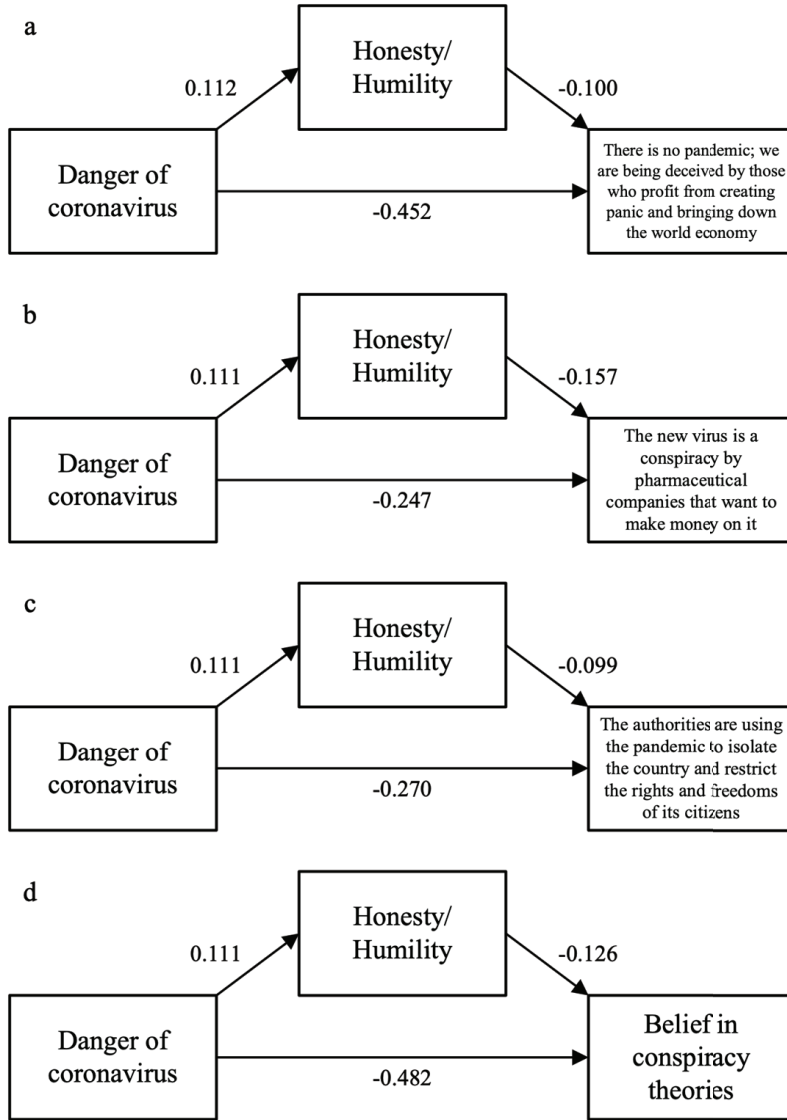


Figure 2. Mediation analysis for the effect of Danger of COVID-19 on Belief in Conspiracy Theories

Moderation Analysis. The aim of the analysis was to determine whether the relationship between Danger of COVID-19 and Belief in Conspiracy Theories depends on the value of Honesty/Humility. The results obtained are presented in Table 3 and Figure 3. The significant differences in the slopes for those who have a high and low level of Honesty/Humility shows that this personality trait moderates the relationship between Danger of COVID-19 and Belief in Conspiracy Theories. Honesty/Humility does not change the direction of the relationship between the perception of danger and conspiracy beliefs, but reduces the perception of the danger of COVID-19.

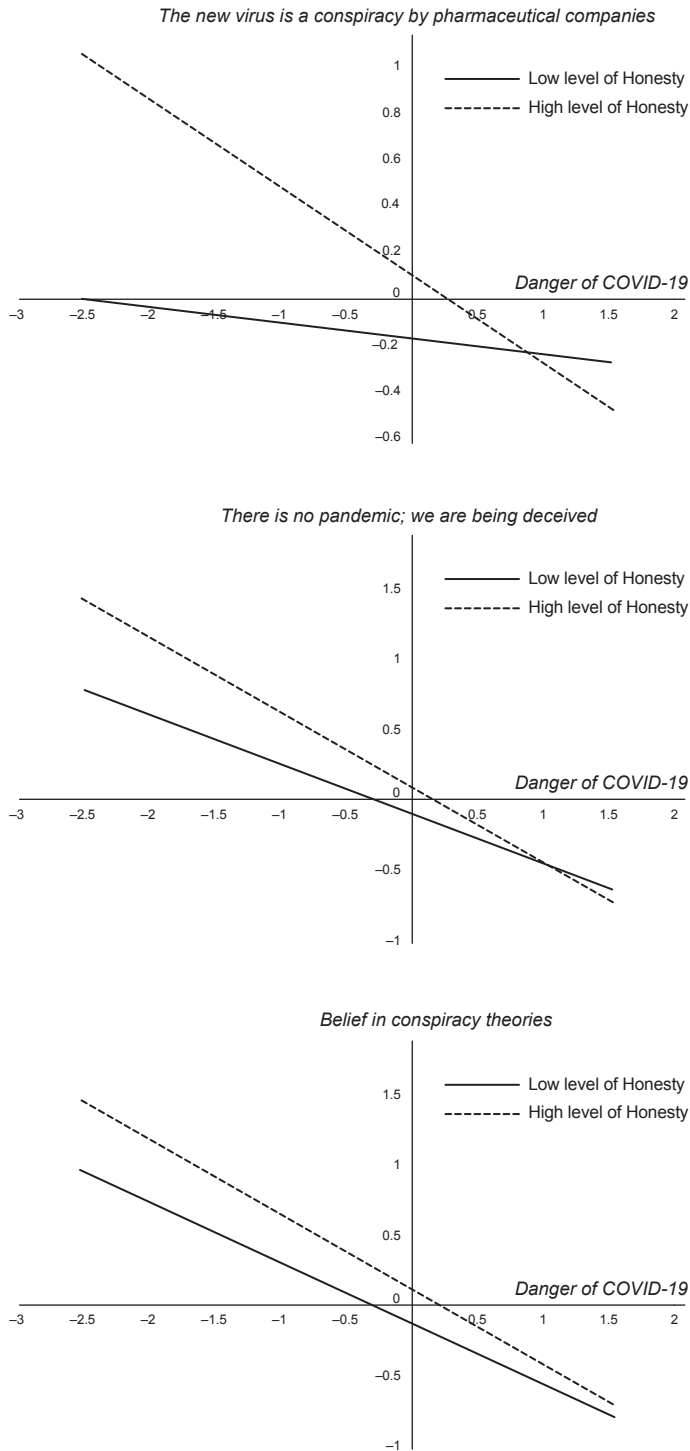


Figure 3. Relationship between the perception of the Danger of COVID-19 and Belief in Conspiracy Theories according to the value of Honesty/Humility

Table 3

Results of the moderation analysis

	There is no pandemic...		Conspiracy by pharmaceutical companies...		Belief in Conspiracy Theories Scale	
	b	Sign.	b	Sign.	b	Sign.
Intercept	-.01	.79	-.03	.39	-.01	.80
Predictor (Danger)	-.44	.000	-.22	.000	-.48	.000
Moderator (Honesty/Humility)	-.09	.011	-.14	.000	-.12	.001
Predictor * Moderator	.09	.005	.16	.000	.05	.095
Simple slope Low	-.54	.000	-.37	.000	-.54	.000
Simple slope High	-.35	.000	-.06	.241	-.43	.000
Intercept Low	.08	.103	.11	.040	.11	.021
Intercept High	-.10	.046	-.17	.001	-.13	.010
Sign. intercept differences		.011		.000		.001
R squared		.23		.13		.27

Thus, when comparing the outermost groups of Belief in Conspiracy Theories, significant differences were found for personality traits, most often for the Honesty/Humility factor. This factor was also the only significant predictor of Belief in Conspiracy Theories in regression analysis and moderated the relations between the estimate of danger and conspiracy beliefs; however, the contribution of personality traits to variance in Belief in Conspiracy Theories was only equal to 3.1%, while the role of Honesty/Humility as a mediator in the effect of the Danger of COVID-19 on Belief in Conspiracy Theories is very small.

Belief in Conspiracy Theories and Its Relation to Recognition of the Need for Quarantine

When comparing the scales of the questionnaire, the authors considered first of all the extent to which individual differences in conspiracy beliefs are predicted by perceptions of the danger of the coronavirus and the feeling of helplessness in the face of the growing threat of COVID-19 and, second, the extent to which conspiracy beliefs and other indicators of the questionnaire predict unwillingness to recognize the need for quarantine.

The scales of the questionnaire that were later used in regression analysis include Belief in Conspiracy Theories, Danger of COVID-19, Denial of Danger, Recognition of the Need for Quarantine, and Hopelessness. All of the scales have significant correlations (*Table 4*).

Hierarchical linear regression was conducted to determine the effect of the perception of the Dangers of COVID-19 and Hopelessness on Belief in Conspiracy Theories. Demographic characteristics such as age and gender, as well as the date when the questionnaire was filled out, were considered as predictors in the first step. The scales of the questionnaire were included in the second step.

Table 4
Correlations between inventory scales

Scale	1	2	3	4	5
1. Belief in Conspiracy Theories	a = .72	-.46**	.85**	-.32**	.32**
2. Danger of COVID-19		a = .73**	-.77**	.44**	-.36**
3. Denial of Danger			a = .78	-.42**	.50**
4. Recognition of the Need for Quarantine				a = .59	-.28**
5. Hopelessness					a = .43

Note. N = 667. * $p < .01$, ** $p < .001$

Social and demographic characteristics did not exhibit a relation to beliefs. Both of the scales that were included in the second step were shown to be significant predictors of Belief in Conspiracy Theories: Danger of COVID-19 ($b = -.43, p < .001$) and Hopelessness ($b = .18, p < .001$). The model accounts for 28% of variance, and all variance inflation factors were < 1.20 .

Mediation analysis that examined the effect of the Danger of COVID-19 on Recognition of the Need for Quarantine (Figure 4) exhibited a mediating effect of Belief in Conspiracy Theories. The model is just identified, so the chi-square in the model is zero. All coefficients and mediated effects are statistically significant ($p < 0.05$); however, mediation is proximal, which reduces the effect size.

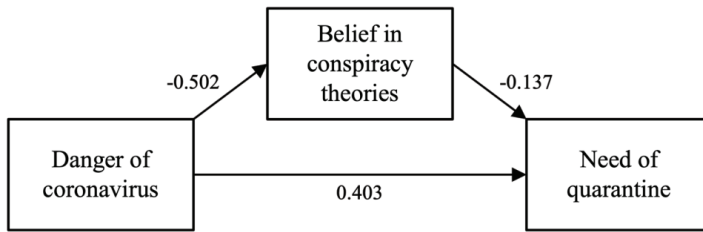


Figure 4. Mediation analysis for the effect of Danger of COVID-19 on Recognition of the Need for Quarantine

Hierarchical linear regressions were also conducted to determine the effect of the predictors of Recognition of the Need for Quarantine. The same parameters were included in the first step: gender, age, and date (Table 5). In all cases, the date when the questionnaire was filled out was a significant predictor of attitudes toward quarantine. One scale from the questionnaire was added to each of the three models in the second step: Belief in Conspiracy Theories (regression 1, $b = -.34, p < .001$, adj. $R^2 = 0.13, \Delta R^2 = 0.11$), Denial of Danger (regression 2, $b = -.36, p < .001$, adj. $R^2 = 0.15, \Delta R^2 = 0.13$), and Hopelessness (regression 3, $b = .33, p < .001$, adj. $R^2 = 0.13, \Delta R^2 = 0.11$).

In the fourth regression (regression 4, adj. $R^2 = 0.27, \Delta R^2 = 0.25$), all three scales were added in the second step: Belief in Conspiracy Theories ($b = -.11, p < .001$), Danger ($b = .38, p < .001$), and Hopelessness ($b = -.12, p < .001$).

Table 5

Hierarchical linear regression: dependent variable: Recognition of the Need for Quarantine

Predictors	Regression 1	Regression 2	Regression 3	Regression 4
1.(Intercept)				
Gender	-.07	-.07	-.07	-.070
Age	-.06	-.06	-.06	-.055
Date	-.14*	-.14**	-.142	-.14**
2. (Intercept)				
Gender	-.08	-.10*	-.08	-.09*
Age	-.05	-.07	-.04	-.05
Date	-.12*	-.14**	-.13	-.13**
Conspiracy Beliefs	-.34**	-	-	-.11**
Danger of COVID-19	-	-	-	.38**
Denial of Danger	-	-.36**	-	-
Hopelessness	-	-	-.31	-.12**
Adj.R ²	0.13	0.15	0.12	0.27
Change R ²	0.11	0.13	0.10	0.25

Note. N = 667, * p < .01, ** p < .001

Thus, the date when the questionnaire was filled out accounted for a small percent of regression variance: The later the date, the more negative the attitude toward the introduction of quarantine. Each of the other predictors of Recognition of the Need for Quarantine accounted for 11–13% of variance, and their joint effect when controlling for gender, age, and date was 27%. The higher the perception of the danger of COVID-19, the more support was expressed for the introduction of quarantine. The higher the belief in conspiracy theories and hopelessness, the more negative the attitude toward the introduction of quarantine. All models were significant in the first and second steps. Even though the scales of the questionnaire correlate with each other, multicollinearity does not appear to have a significant effect on individual predictors: Variance inflation factors in all models were <1.45.

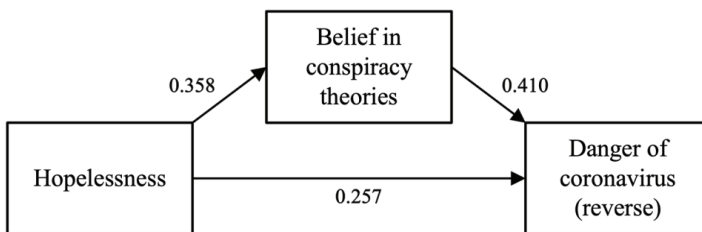


Figure 5. Mediation analysis for the effect of Hopelessness on Danger of COVID-19

The result obtained in the regression analysis suggested an indirect effect between Hopelessness and Danger; mediation analysis (*Figure 5*) exhibited a mediating effect of Belief in Conspiracy Theories. The model is just identified, so the chi-square in the model is zero. All coefficients and mediated effects are statistically significant ($p < 0.05$).

Discussion

The first hypothesis of the study addressed the relation of conspiracy beliefs to the assessment of the danger of COVID-19 and the recognition of the need for quarantine. The results confirmed the hypothesis: The higher the conspiracy beliefs, the less concerned the respondents are about the danger of COVID-19 and the lower their support is for the introduction of quarantine measures. Our data are in line with the results of a sociological survey conducted in Russia in late May, when COVID-19 cases had almost peaked. At that point, 32.8% of respondents believed that the pandemic was “a fabrication by interested parties” or that “there will be no epidemic” (at the time of the survey, the number of coronavirus cases had reached 363,000). Compared to those who considered COVID-19 dangerous, those who did not were less likely to recognize the need for quarantine (74% vs. 10%) and more likely to violate quarantine restrictions — for example, by meeting relatives (42% vs. 18%), socializing with friends (41% vs. 12%), or taking walks (55% vs. 31%) (Artamonov & Lavrent'ev, 2020).

Naturally, conspiracy theory believers were not the only ones violating quarantine. Reasons for disobeying quarantine restrictions can reflect situational needs (e.g., helping relatives) or have deep psychological roots. Individuals might resist restrictions not because they are opposed to them in principle, but because they associate the restrictions with “incorrect” and socially undesirable behavior. For example, it has been shown that individuals with high anxiety perceive people wearing masks, which are required during quarantine, as being ill or untrustworthy (Olivera-La Rosa, Chuquichambi, & Ingram, 2020). It is therefore not surprising that they themselves will try to wear masks as little as possible.

Nevertheless, belief in conspiracy theories contributes to the violation of quarantine measures and, as our study showed, Belief in Conspiracy Theories — together with assessment of the Danger of COVID-19 and Hopelessness — accounts for more than a quarter of variance in the Recognition of the Need for Quarantine indicator.

The study also shows that attitudes toward quarantine become more negative as its duration increases. On the one hand, this seems inevitable: A sudden change in the familiar situation, restriction of movement to an apartment, and confinement of socialization to the Internet cannot but elicit a desire to return to normal life. On the other hand, our study was conducted during the first three of the ten weeks of quarantine, when the restrictions should not have been perceived as such a burden yet. The students who participated in our study are among the social groups least affected by quarantine measures. Furthermore, at the time, the number of coronavirus infections was rising by 10–25% every day, so it should not have seemed that the authorities were too quick to introduce quarantine measures. Nevertheless, the

study showed that the date when the questionnaire was completed had an effect on attitudes toward the need for quarantine.

The second hypothesis concerned the link between conspiracy beliefs and hopelessness. As expected, there is a positive association between the two indicators. Hopelessness has a significant correlation with all items on the Belief in Conspiracy Theories scale and with the overall scale, accounting for 11% of variance of the scale. Just like conspiracy beliefs, Hopelessness has a negative association with perceptions of the Danger of COVID-19 and with the Recognition of the Need for Quarantine, and a positive association with feeling that there is insufficient information about the number of coronavirus infections in the country. There was also a striking lack of logic — if not a paradox — in the structure of the links of Hopelessness with other indicators: If COVID-19 is no more dangerous than the flu, or if the pandemic does not exist at all, and those who consider all reports about the coronavirus to be a conspiracy of dark forces are right, then why does it seem that we lack comprehensive information about the number of infections (there should be none at all) and, above all, where does the sense of hopelessness come from (“everyone will get sick,” “people are powerless before the forces of nature,” “no measures will help,” and “the epidemic will develop along the same scenario everywhere”)?

The data obtained most likely illustrate a lack of sensitivity to contradictions, which is typical of irrational thinking, and demonstrate a situation that promotes the emergence of conspiracy beliefs. Inability to respond to external threats and the feeling of not having enough information (along with fear that the real situation could be even worse) stimulate a desire to create an illusion of safety (“there is no pandemic”). However, the problem of lack of control over the situation remains. It is possible that, to some extent, disobeying quarantine restrictions serves as a surrogate for control, sustaining the illusion of control over the situation; however, the overall sense of the unpredictability of the situation cannot be overcome. To a certain degree, these speculations are supported by our data showing that the correlation between Hopelessness and the Danger of the situation are mediated by Belief in Conspiracy Theories.

The third hypothesis is related to the links that personality traits have with Belief in Conspiracy Theories and Recognition of the Need for Quarantine.

Our study did not confirm the hypothesis that personality traits can serve as predictors of conspiracy beliefs in a stressful situation such as the COVID-19 pandemic. Regression analysis showed that the only significant predictor of conspiracy beliefs is Honesty/Humility (the higher the scores for this trait, the less likely the individual is to believe in conspiracy theories); however, the overall effect of all personality traits that comprise the 6-factor model of personality (HEXACO) was not significant and accounted for only 3% of variance in conspiracy beliefs.

These results are not surprising. Although multiple studies have shown that belief in conspiracy theories is associated with Openness to Experience, Emotional Stability, and Agreeableness (e.g., Swami et al., 2011), these links were not reproduced in a meta-analysis (Goreis & Voracek, 2019). Our study also indicates that these links did not show through in a situation that raises anxiety levels and disrupts everyday life.

At the same time, it is clearly premature to abandon efforts to find links between factor-level traits and belief in conspiracy theories. Personality predisposition to

conspiracy beliefs in dangerous and unpredictable situation will likely emerge in extreme views — i.e., at the edges of the distribution rather than in the mean range, which masks personality predisposition.

In our study, we compared personality traits in extreme groups of conspiracy believers. When comparing the outermost groups based on items of the Belief in Conspiracy Theories scale, differences were found most frequently for Honesty/Humility. Honesty/Humility scores are significantly lower for groups that believe in conspiracy theories than for groups that do not. Since Honesty/Humility is associated with the moral aspects of behavior and is seen as a character trait that is opposite to the Dark Triad (Lee & Ashton, 2005; Lee et al., 2013), it stands to reason that individuals who are less sensitive to, or less concerned about, moral issues are more prone to conspiracy beliefs.

The effect of personality traits on recognition of the need for quarantine accounted for only 2% of variance; Emotionality and Conscientiousness were significant predictors of Recognition of the Need for Quarantine. Similar results (low contribution of personality traits to variance in quarantine-related behavior) were obtained when comparing the Big Five personality traits with COVID-19 voluntary compliance behaviors (Clark, Davila, Regis, & Kraus, 2020) and compliance with COVID-19 restrictions (Zajenkowski, Jonason, Leniarska, & Kozakiewicz, 2020). In the first of these two studies, researchers from the U.S., France, and Great Britain surveyed 8,317 respondents from 70 countries online. Respondents who believe that quarantine measures are effective in fighting the pandemic, who consider them important for protecting their own health, and who trust the government are more likely to comply with restrictions. Correlation analysis did not demonstrate a relationship between personality traits and compliance, and accounted for only 1% of variance in compliance behaviors. Two personality traits were significant predictors: The lower the Extraversion and Emotional Stability, the higher the compliance behaviors (Clark et al., 2020). In the second study, which was conducted online with a Polish sample ($n = 263$), the Big Five accounted for 2% of variance in compliance with restrictions; the only significant predictor of compliance with restrictions was Agreeableness (Zajenkowski et al., 2020). Thus, personality traits have virtually no effect on the recognition or non-recognition of the need for quarantine.

We should note that significant gender differences were only found for one indicator: Recognition of the Need for Quarantine. Women are more likely to support the introduction of quarantine measures. For all the other indicators — Belief in Conspiracy Theories, Danger of Coronavirus and COVID-19, and Hopelessness — there were no significant differences found between men and women.

Conclusion

The main conclusion of the study conducted during the first three weeks of quarantine is that belief in coronavirus-related conspiracy theories, along with denial of the danger of COVID-19 and hopelessness, have a significant effect on attitudes toward quarantine — the recognition (or non-recognition) of the need for quarantine and compliance with measures aimed at reducing the spread of infection.

The study serves as a description of the determinants of quarantine that essentially “lie on the surface.” The next stage of the study will be to analyze more

thoroughly “existence and experience” during the quarantine period — from the time when it was first declared until the substantive easing of public quarantine measures.

Limitations

The sample of the study was relatively homogenous in age and social position, and it was a good representation of the European regions of Russia. However, the sample was not balanced in gender (there were three times as many women as men), and it was most likely not representative of the student population, because the participants were all volunteers.

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