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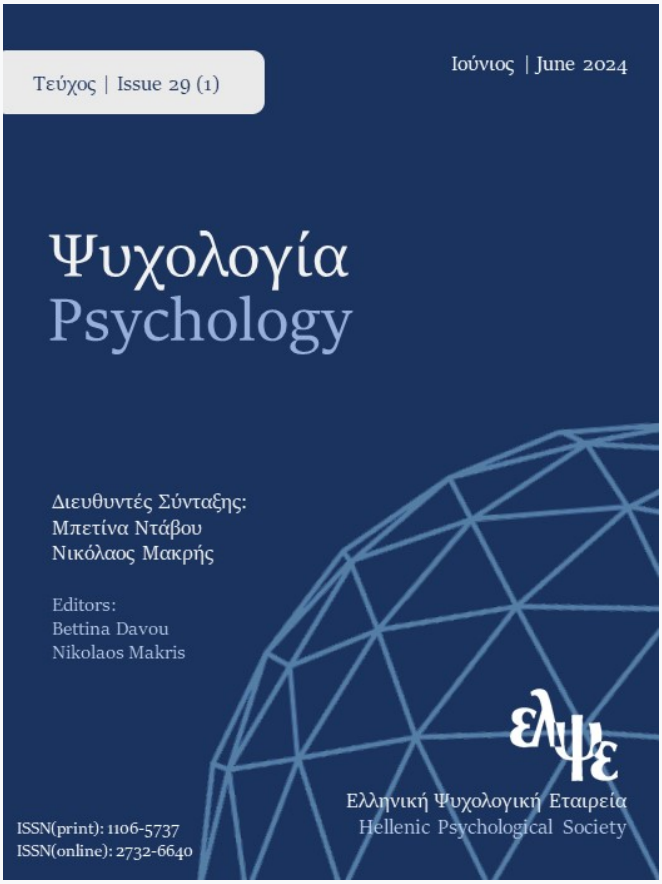

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From reflective functioning to conspiracy thinking in the COVID-19 pandemic: Direct and indirect pathways

Anna CHRISTOPOULOS[1], Vassilis PAVLOPOULOS[1], Antonios POULIOS[1], Kalliopi KARADIMITRI[1], Emmanouil LAGOS[1], Maria STAVRAKAKI[1], Eva STEFANAKOU[1], Katerina ALEXOPOULOU[1], Alexandra BEKIARI[1], Mara KTENA[1], Christos PANARITIS[1], Charalampos RISVAS[1], Melina TSIODRA[1], Valeria POMINI[2], Rossetos GOURNELLIS[3]

[1] Department of Psychology, School of Philosophy, National and Kapodistrian University of Athens
[2] First Department of Psychiatry, Eginition Hospital, School of Medicine, National and Kapodistrian University of Athens
[3] Second Department of Psychiatry, Attikon Hospital, School of Medicine, National and Kapodistrian University of Athens

KEYWORDS

Reflective functioning
Conspiracy thinking
COVID-19 pandemic
Trust
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Emotionality

CORRESPONDENCE

Anna Christopoulos, Department of Psychology, School of Philosophy, National and Kapodistrian University of Athens, Zografos University Campus, 15784 Athens, Greece
annachr@Psych.uoa.gr

ABSTRACT

The COVID-19 pandemic has led to a surge of conspiracy theories that are used to explain this health crisis. Belief in these theories in turn has significant implications regarding adherence to scientifically based health measures and the seeking of appropriate medical treatment. However, the precursors of conspiracy thinking have not yet been fully understood. The current study investigated the direct and indirect effect of reflective functioning on conspiracy thinking through the role of generalized perceived threat of the virus, positive and negative emotions, trust in scientists, and trust in God in a sample of 1,730 adults in Greece. The results indicate that enhanced capacity for reflective functioning is associated with less likelihood of conspiracy theory endorsement. Higher levels of reflective functioning were associated with increased negative emotionality, lower levels of generalized perceived threat, greater trust in scientists, and less trust in God. Reflective functioning in and of itself did not predict conspiracy theory endorsement directly. Rather, this relationship was fully mediated by negative emotionality, generalized perceived threat, and higher levels of trust in scientists. These findings support recently proposed positions indicating that reflective functioning has a significant role in the framework of the COVID-19 pandemic.

Introduction

The COVID-19 pandemic, considered a once-in-a-century phenomenon, has resulted in more than 2 million deaths worldwide as well as in physical impairment as consequences of the disease (Gates, 2020). This pandemic has undoubtedly affected the physical and psychological well-being of the world community in multiple ways (Brooks et al., 2020; Weir, 2020). Psychosocial researchers and practitioners have been called to action in order to facilitate understanding of the psychological implications of the crisis for people and society (Asmundson & Taylor, 2020). Aiming to contribute to the existing body of knowledge regarding the psychosocial factors associated with the COVID-19 pandemic and its impact, in this study we investigate the association of reflective functioning with conspiracy thinking, taking into account other psychological factors and their mediating role in that relationship.

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Conspiracy thinking in times of crises

From the outbreak of the pandemic and during its whole course, there has been a surge in conspiracy theories used to explain it (Farias & Pilati, 2021; Friedman, 2021). Numerous theories have been proposed, which are considered to fall into two logically incompatible groups. The first has to do with a denial of the severity and danger of the virus, which is considered no worse than the flu but is portrayed as dangerous for the advantages of certain individuals (e.g., to deleteriously affect economies and lower wages). The second group of theories proposes that the virus has been intentionally manufactured for political or economic benefits (Imhoff & Lamberty, 2020). Specific details within the second group vary widely ranging from the idea, that the cause is the new 5G networks, that Bill Gates is using the situation in order to create a means of global surveillance, or that the Chinese government created the virus to overthrow Western economies, particularly the United States (Allyn, 2020; Havey, 2020; Shahsavari et al., 2020).

Conspiracy theories are particularly important, as they are linked to adherence to health measures and to seeking appropriate medical treatment (Farias & Pilati, 2021; Friedman, 2021; Georgiou et al., 2020; Swami & Barron, 2020). Recently, Plohl and Musil (2021) found that belief in conspiracy theories along with risk perception significantly predicted lack of trust in medical specialists, such as virologists and immunologists. Belief in conspiracy theories is associated with lack of adherence to measures as well as with dangerous behaviors, such as the ingestion of disinfectant or use of UV light to radiate the body (Abaido & Takshe, 2020; Pavela et al., 2020; Phohl & Musil, 2021; Teovanović et al., 2020). Belief in conspiracy theories has been specifically found to reduce social distancing over time (Bierwiaczonek et al., 2020). In a previous study, conspiracy theories were found to significantly mediate the effect of trust in scientists and perceptions of generalized threat in predicting adherence to health measures and endorsement of scientifically based government policies (Pavlopoulos et al., 2021). Thus, further understanding of conspiracy theories is indicated with respect to the pandemic, as well as for planning for similar situations in the future, as the endorsement of such theories has critical implications for societal well-being.

The study of conspiracy theories has been a source of interest and concern in the literature for many years (Bogart & Thornburn, 2005; Ford et al., 2013; Oliver & Wood, 2014; Setbon & Ruade, 2010; Van Prooijen & Douglas, 2018). Conspiracy theories have been defined as "false beliefs in which the ultimate cause of an event is believed to be due to a plot by multiple actors working together with a clear goal in mind, often lawfully and in secret" (Swami & Furnham, 2014, p. 220). Conspiracy theories have been noted to proliferate in times of crisis (Imhoff & Lamberty, 2020; Van Prooijen & Douglas, 2017). They provide simple answers and thus relieve uncertainty and anxiety for many individuals, as well as a sense of structure and purpose in the world (Friedman, 2021). While endorsement of conspiracy theories may be in response to a specific crisis, such as COVID-19, a general tendency to espouse conspiracy theories has been identified, namely a conspiracy mentality, which has to do with the inclination to believe that powerful forces operate in secret to rule the world in general (Dagnall et al., 2015; Imhoff & Lamberty, 2020). Individuals with this mentality endorse multiple conspiracy theories even when these are contradictory (Wood et al., 2012). In previous work, conspiracy mentality was linked to reduced trust in governmental positions, a stronger acceptance of violence, and engagement in illegal non-normative forms of behavior to reach one's goals or support one's political beliefs (Imhoff et al, 2020; Rees & Lamberty, 2019). In the case of COVID-19, conspiracy thinking was related to justification of and willingness to use violence (Jolley & Paterson, 2020).

Various factors have been found related to the tendency to believe in conspiracy theories. Lower levels of education are linked to endorsement, while higher levels of education buffer against belief in conspiracy theories (Georgiou et al., 2019; Van Prooijen et al., 2017). Conspiracy theories are also linked to rejection of science (Lewandowsky et al., 2013), a finding which has also been established for COVID-19 (Miller, 2020; Plohl & Musil, 2021). Political orientation has been found to be associated with endorsement of conspiracy theories, with those

on the extreme left or right as more prone to endorse conspiracy theories in comparison to those who were more moderate in their beliefs (Van Prooijen, 2018). Latkin et al. (2021) found that more conservative political ideology was associated with COVID-19 conspiracy thinking in the United States. In another study, individualism was found to be related to COVID-19 conspiracy theories (Biddlestone et al., 2020). Religiosity was found to be positively associated with COVID-19 conspiracy ideation and negatively associated with trust in scientific research (Dein et al., 2020; Freeman et al., 2020; Plohl & Musil, 2021).

Cognitive and emotional determinants of conspiracy thinking

Studies have revealed that a number of psychological factors are linked to the endorsement of conspiracy theories. The need for cognitive closure, that is, for clear answers so as to eliminate any ambiguity in a given situation, has been found to predict the adoption of such theories (Marchlewska et al., 2018). Low self-esteem and feelings of powerlessness, low levels of interpersonal trust, and death-related anxiety have been linked to endorsement of conspiracy theories (Abalakina-Paap et al., 1999; Goertzel, 1994; Newheiser et al., 2011). Underlying psychopathology, particularly schizotypal and paranoid personality characteristics, as well as a tendency towards magical or even delusional thinking, have been implicated in conspiracy ideation (Barron et al., 2018; Dagnall et al., 2015; Georgiou et al., 2019; Lobato et al., 2014). Conversely, the capacity to think analytically and reflectively was associated with low COVID-19 conspiracy theory endorsement (Sadeghiyeh et al., 2020).

The role of emotionality in COVID-19 conspiracy thinking has been the subject of empirical investigation but with somewhat contradictory findings. With respect to negative emotions, Fountoulakis et al. (2020) found that conspiracy beliefs were linked to depression and mental distress, although according to the authors, it is not clear whether these beliefs might cause depression or serve as a defense mechanism against depression. Higher levels of anxiety were also associated with the tendency to espouse conspiracy theories (Kranz et al., 2020). However, Georgiou et al. (2020) found that conspiracy beliefs regarding COVID-19 were linked to a pre-existing conspiracy system rather than the current emotional state. Interestingly, no association between positive emotions and COVID-19 conspiracy thinking has been reported in research to date.

Moreover, contradictory findings have been obtained regarding the association between positive emotionality and other factors that are not directly related to conspiracy thinking per se but have to do with significant COVID-19 parameters. For example, optimism has been found to undermine individuals' motivation to take medically indicated precautions (Park et al., 2021). This may be linked to the lack of association between knowledge and optimism that was documented in another study (Sheetal et al., 2020). On the other hand, optimism has been found to be positively related to resilience (Sánchez-Teruel & Robles-Bello, 2020), negatively related to anxiety (Biber et al., 2020), to buffer against the negative ramifications of intolerance to uncertainty (Reizer et al., 2021), and to mediate the effect of coronavirus stress on psychological problems in adults (Arslan et al., 2020).

Attachment style has also been linked to belief in conspiracy theories. In a recent multinational study, anxious attachment was associated with a greater tendency to endorse conspiracy theories, even when accounting for other known predictors of conspiracy such as education and religiosity. Interestingly, avoidant attachment was not linked to belief in conspiracy theories (Green & Douglas, 2018).

Reflective functioning and its role in conspiracy thinking endorsement

The aforementioned findings indicate the complex nature of the relationship between various psychological factors and conspiracy theory endorsement, highlighting the need for further understanding of this association. With this objective in mind, we considered that investigation of fundamental aspects of internal mental processes could add to the existing body of knowledge to date in depth and breadth. In this regard, the role of reflective functioning would be of interest and significance. Reflective functioning, also known as mentalization, is defined as the quintessential human capacity to understand the self and others with respect to internal mental states

(Fonagy et al 2018). These states include feelings, desires, wishes, fears, attitudes, and goals (Luyten et al., 2020). Reflective functioning is considered to be critical with respect to the individuals' capacity to navigate their interpersonal world. It has been linked to the capacity to acknowledge and regulate emotion. Problems in mentalization have also been linked to various forms of psychopathology (Luyten et al., 2020; Luyten & Fonagy, 2018; Nolte et al., 2011; Robinson et al., 2019).

Reflective functioning has most recently been indicated as a psychological domain of interest within the COVID-19 framework (Poulios et al., 2021). In a recent perspective article, Steele (2020) considers that a lack of reflective functioning in global leadership may be related to COVID-19 conspiracy theory propagation. From a somewhat different viewpoint, Lassri and Desatnick (2020) underscore the significance of reflective functioning in the context of the COVID-19 pandemic. They report that on the basis of clinical observation, reflective functioning appears to be compromised in many individuals as a result of the COVID-19 pandemic. Moreover, they consider that it is "of paramount importance to work with patients but also with people in the wider community, with a focus on facilitating reengaging mentalizing capacity" (Lassri & Desatnick, 2020, p. S39).

According to these findings, it can be assumed that the capacity for mentalization will lead to less endorsement of conspiracy theories. Being able to realistically reflect on the mental state of others (including policy makers, scientists, and lay people) and on the pragmatic complexities of the COVID-19 pandemic would make it less likely to resort to an imaginary way of making sense of the situation or to selectively focus on information that would fuel conspiracy thinking.

Research hypotheses

In light of the above-presented literature review, the hypotheses of the present study are formulated as follows:

H1: Increased capacity of reflective functioning would predict lower levels of conspiracy theory endorsement. On the basis of findings regarding psychological parameters related to conspiracy theory endorsement, we hypothesized that increased capacity for reflective functioning would predict lower COVID-19 conspiracy theory endorsement. One of the significant dimensions of reflective functioning is that of epistemic trust, i.e., the ability to appraise information from the external world as accurate, reliable, and personally relevant, and allowing for the information to be incorporated into existing knowledge domains. It is an individual's capacity and willingness to consider new knowledge as relevant and trustworthy, and therefore worthy of integration into their way of thinking (Fonagy & Allison, 2014).

H2: Emotionality would be positively associated with reflective functioning and related to conspiracy theory endorsement. Given the significance of emotion in the realm of reflective functioning, as well as with respect to conspiracy thinking, we were interested in investigating the role of emotions in the relationship between these two domains. That is, we sought to examine whether, and if so, how positive and negative emotions are involved in the relationship between mentalization and COVID-19 conspiracy thinking. Since acknowledgment and regulation of emotion has been associated with reflective functioning, we predicted that the individuals' reporting of both types of emotion would be associated with higher levels of reflective functioning. However, we did not make any predictions about the role of emotions in conspiracy thinking, given the somewhat contradictory findings to date regarding negative emotions and conspiracy endorsement (Foundalakis et al., 2020; Georgiou et al., 2020; Kranz et al., 2020). Moreover, since there has been no investigations to date regarding the relationship between positive emotions and conspiracy thinking, we were similarly not in a position to make predictions about the role of positive emotions in conspiracy thinking or in the relationship between reflective functioning and conspiracy thinking.

H3: Perception of generalized threat of COVID-19 would be associated with reflective functioning. Based on findings of a previous study on the significance of individual perceptions of generalized threat of COVID-19 virus as the predictor of belief in conspiracy theories and endorsement of scientifically based government policies (Pavlopoulos et al., 2021), we were interested in the role of this variable in the relationship between reflective

functioning and conspiracy thinking. Thus, we considered that generalized threat, i.e., perceptions of deleterious virus impact on multiple domains, comprised of specific social groups (e.g., minorities or health workers) as well as more abstract concepts (e.g., capitalism, the Western world) would be related to reflective functioning capacity.

H4: Trust in science would be positively associated with reflective functioning and negatively associated with conspiracy theory endorsement. Also of interest was the role of trust in science with respect to the relationship between reflective functioning and conspiracy theories. Given previous findings that trust in science was negatively associated with conspiracy endorsement (Pavlopoulos et al., 2021), as well as the fact that epistemic trust is an essential component of reflective functioning, we hypothesized that trust in scientists would be positively related to reflective functioning and negatively related to conspiracy theory endorsement.

H5: Trust in God would be negatively associated with reflective functioning and positively associated with conspiracy theory endorsement. Finally, in some juxtaposition to the role of trust in science, we examined the role of trust in God as another possibly significant aspect in the relationship between reflective functioning and conspiracy theories. In previous studies, religiosity was found to be negatively associated with trust in scientific COVID-19 research and positively associated with COVID-19 related conspiracy ideation (Freeman et al., 2020; Plohl & Musil, 2021). Moreover, religiosity has been found to be negatively related to the intention to receive COVID-19 vaccination (Olagoke et al., 2020). In a related study, Kranz et al. (2020) found that religiosity was negatively associated with analytical thinking and positively associated with unreasonable and dangerous behavioral practices. These results are in line with those of Dein et al. (2020) who found that religiosity across faiths and cultures is related to unsafe behavioral practices with respect to COVID-19. On the basis of these findings, we considered that trust in God would be negatively associated with reflective functioning and positively associated with conspiracy theory endorsement.

Method

Participants

Informed consent and valid answers were provided by 1,730 participants from a total of 2,881 visits to the online questionnaire of the study. Of them, 1,225 (70.9%) identified themselves as women, 502 (29.1%) as men, and three (0.2%) as non-binary or gender fluid. Their mean age was 34.6 years (SD = 13.3, range: 18-80 years). The majority of participants were of Greek ethnicity with small numbers of non-Greek (n = 21, 1.2%) or mixed ethnicity (n = 45, 2.6%). Regarding family status, 574 (33.2%) were single, 446 (25.8%) in a relationship, 480 (27.7%) were married, and 229 (13.3%) had a different living arrangement. Relatedly, 1,230 (71.1%) did not have a child while 41 (2.4%) had three or more children. With regards to education, 54 (3.1%) had a PhD degree, 286 (22.3%) had a Master's diploma, 794 (45.9%) were university graduates, 99 (5.7%) had professional or technical education, and 395 (23.3%) had finished secondary school. About two-thirds of the participants (n = 1,222, 66.4%) lived in the wider Athens metropolitan area, while 161 (9.4%) lived in a city with more than 100,000 inhabitants, 151 (10.3%) lived in an urban area with a population of up to 100,000, 85 (7.0%) lived in a small town (up to 10,000 inhabitants) and 69 (6.4%) lived in a rural area (up to 2,000 inhabitants).

Measures

This study was part of a larger research project aiming to explore the perceived causes and the psychosocial impact of the COVID-19 pandemic in Greece. The measures used for the purposes of the study were as follows:

Reflective functioning. Reflective functioning was assessed with the Reflective Functioning Questionnaire (RFQ; Fonagy et al., 2016). This questionnaire measures the level of certainty and uncertainty about self and others' mental states. It consists of eight items, six of which are used in both its scales (with reversed coding). Certainty is assessed with six items (e.g., "Sometimes I do things without really knowing why" – reversed) and uncertainty

is assessed with six items (e.g., "Strong feelings often cloud my thinking"). All items are scored on a 7-point Likert-type scale, ranging from fully disagree to fully agree. Items are then rescaled to 3, 2, 1, 0, 0, 0, 0 for certainty and 0, 0, 0, 0, 1, 2, 3 for uncertainty, respectively. According to the authors, this is done in order to capture extreme states of hyper- or hypo-mentalizing, that would rather not be functional states of mind. RFQ is validated for the Greek population by Griva et al. (2020).

Conspiracy mentality. The Conspiracy Mentality Questionnaire (Bruder et al., 2013) was employed to assess the endorsement of generic conspiracy theories. This questionnaire is designed to measure the tendency to rely on explanations that evoke secret actions of small power groups within cultures as well as cross-culturally. It consists of five items (e.g., "I think that there are secret organizations that greatly influence political decisions"), rated on a 7-point *Likert scale from 1 = fully disagree to 7 = fully agree*. Higher scores indicate a stronger conspiracy mentality.

Pandemic related emotionality. Participants were asked to report their feelings regarding the COVID-19 pandemic on a 7-point *Likert scale from 1 = fully disagree to 7 = fully agree*. Principal component analysis with varimax rotation yielded two components on the basis of parallel analysis, which explained 57.7% of the total variance. Negative emotionality (Component 1) was assessed as the mean of anger, sadness, fear, anxiety, and surprise; while positive emotionality (Component 2) was assessed as the mean of happiness, indifference, and calmness.

Perceived generalized threat. Generalized perceptions of threat posed by the pandemic were assessed through 11 items focusing on specific social groups ("vulnerable groups", "ethnic minorities", "the poor and the unemployed", "workers in the health sector", "workers in crowded settings"), the national level ("the national economy", "national security"), and the global system ("the world order", "the Western world", "the developing countries", "capitalism"). Principal component analysis indicated the unifactorial structure of this scale. A 7-point Likert scale was used, *from 1 = fully disagree to 7 = fully agree*; therefore, higher scores indicate stronger perceptions of generalized threat from the pandemic.

Trust in scientists. Participants' trust in scientists to deal with the COVID-19 crisis was measured with two items, namely "I trust the scientific community" and "I trust the public health institutions", rated on a 7-point scale *from 1 = not at all to 7 = very much*.

Trust in religion. Participants' trust in God and religious institutions to deal with the COVID-19 crisis was measured with two items, namely "I trust the church" and "I have trust in a superior divine power", rated on a 7-point scale from *1 = not at all to 7 = very much*.

Procedure

This was an online research project. Data was collected using Google Forms. Participants were recruited through social media groups and announcements posted on a university website. In the introductory section of the questionnaire, participants were informed of the purpose of the study and of ethical issues, i.e., the voluntary, anonymous, and confidential nature of the data, as well as their right to refrain from the study at any time. Then they were asked to provide their informed consent and proceed to the main part of the questionnaire. The period of data collection was during the first COVID-19 lockdown in Greece, from April 27 to May 3, 2020. The study was conducted in accordance with the Helsinki Declaration concerning ethical principles for medical research involving human subjects.

Data analysis

We first established the unifactorial structure of conspiracy mentality, pandemic-related emotionality, perceived generalized threat, trust in science, and trust in religion by conducting principal component analysis. For the

scoring of the Reflective Functioning Questionnaire, which relies on a clinical conceptual background, we followed the authors' instructions which were recently validated in a Greek sample (Griva et al., 2020). The internal consistency of the scales was examined using Cronbach's alpha coefficient.

A correlation matrix (Pearson's coefficients) of all scale scores was calculated to summarize the data and identify patterns of relationships between the constructs under study. The hypotheses involving mediation effects were tested using model 4 of PROCESS macro for SPSS v. 3.00 (Preacher & Hayes, 2008), which allows for multiple mediators operating in parallel. Two models were examined, where the independent variable was mentalization certainty and uncertainty, respectively. Conspiracy mentality served as the criterion variable in both analyses. Negative emotionality, positive emotionality, trust in health professionals, trust in God, and perceived generalized threat were inserted as mediators. The indirect effect was estimated using the bootstrapping procedure with 2,000 samples. This was preferred over other techniques, such as the Sobel test because it is a powerful yet robust nonparametric resampling method that does not assume normal distributions for any variable (Preacher & Hayes, 2008). The confidence level for bias-corrected confidence intervals was set at 95%.

Results

Descriptive statistics

Descriptive statistics and reliability coefficients of the variables under study are presented in Table 1. Uncertain reflective functioning had a rather low mean and its distribution was positively skewed. A similar tendency was evident for positive emotionality and trust in God as well. On the other hand, the means of trust in scientists, perceived generalized threat, and, to a lesser extent, of negative emotionality were rather high with a tendency for negatively skewed distribution.

Table 1. *Descriptive Statistics of Reflective Functioning, Emotionality, Trust, Perceived Generalized Threat from COVID-19, and Conspiracy Mentality*

	Items	Min	Max	M	SD	Cronbach α
Reflective functioning						
Certainty	6	0.00	3.00	1.01	0.72	.74
Uncertainty	6	0.00	3.00	0.51	0.53	.68
Emotionality						
Negative	5	1.00	7.00	4.08	1.48	.78
Positive	3	1.00	6.33	1.92	1.05	.62
Trust						
Trust in scientists	3	1.00	7.00	5.34	1.46	.68
Trust in God	2	1.00	7.00	1.90	1.44	.65[a]
Perceived generalized threat	13	1.27	7.00	4.55	1.11	.81
Conspiracy mentality	5	1.00	7.00	3.86	1.47	.85

**Note.*[a] Value represents Pearson r (instead of Cronbach α) coefficient.

The Pearson correlation coefficients between the variables under study are presented in Table 2. As shown in this table, certainty in reflective functioning correlated positively with trust in scientists, i.e., increased mentalization certainty was linked to higher trust in scientists. Conversely, increased mentalization certainty was significantly related to lower levels of perceived generalized threat, conspiracy mentality, and negative emotionality, the respective coefficients indicating low strength of association. The above pattern is reversed when it comes to uncertainty in reflective functioning, i.e., increased uncertainty was related to significantly higher levels of perceived generalized threat, conspiracy mentality, and negative emotionality, though the effect of these relationships is rather weak. Conspiracy mentality was significantly related to all the variables we studied with a strength that ranged from low to moderate. Specifically, lower trust in scientists, increased emotionality (both positive and negative), increased trust in God, and higher levels of perceived generalized threat were connected to higher conspiracy mentality.

Table 2. *Pearson correlation coefficients between reflective functioning, emotionality, trust, perceived generalized threat from covid-19, and conspiracy mentality*

	1	2	3	4	5	6	7
1.RF Certainty	1.00						
2.RF Uncertainty	-.60***	1.00					
3.Negative emotionality	-.19***	.19***	1.00				
4.Positive emotionality	.00	.03	-24***	1.00			
5.Trust in scientists	.07**	-.03	.19***	-.04	1.00		
6.Trust in God	-.01	-.01	.12***	-.01	.14***	1.00	
7.Perceived threat	-.07**	.12***	.31***	.03	.19***	.04	1.00
8.Conspiracy mentality	-.07**	.10***	.18***	.09***	-.08**	.09***	.27***

**Note.*p* < .05. ***p* < .01. ****p* < .001. RF: Reflective functioning.

Mediation analyses

As described in Data Analysis, two PROCESS mediation models were run to examine the role of negative emotionality, positive emotionality, trust in health professionals, trust in God, and perceived generalized threat in explaining the relationship of mentalization certainty and uncertainty, respectively, with conspiracy mentality. Figures 1 and 2 depict the path coefficients of these analyses. The indirect effects are summarized in Table 3.

As shown in Figure 1, certainty in reflective functioning yielded a non-significant direct effect on conspiracy mentality. Mentalization certainty was positively related to trust in scientists and negatively related to negative emotionality and perceived generalized threat. The amount of variance explained by these associations ranged from < 1% for perceived generalized threat to 4.3% for negative emotionality. Mentalization certainty was not related to positive emotionality and trust in God. In turn, all mediators were significantly linked to conspiracy mentality, in line with the results of the bivariate correlational analyses. That is, higher positive and negative emotionality, increased perceived generalized threat, higher trust in God and lower trust in scientists predicted more endorsement of conspiracy mentality. Moreover, the indirect effect of mentalization certainty on conspiracy mentality was found to be significant through the mediating role of negative emotionality, perceived generalized

threat, and trust in scientists (Table 3). The mediation of negative emotionality was complementary, in the sense that it tended to increase the association of mentalization certainty with conspiracy mentality, while the mediation of perceived generalized threat and trust in scientists was competitive, which means that these two variables tended to decrease the strength of the relationship between mentalization certainty and conspiracy mentality. The above pattern corresponds to full mediation given the overall non-significant direct effect of mentalization certainty on conspiracy mentality. This model explained 12.4% of the variance of conspiracy mentality.

Table 3. *Indirect effect and 95% bias-corrected confidence interval of reflective functioning on conspiracy mentality*

	Effect	**SE**	**BootLLCI**	**BootULCII**
RF Certainty				
Negative Emotionality	**-.05**	**.02**	**-.08**	**-.03**
Positive emotionality	.00	.01	-.01	.01
Perceived generalized threat	**-.03**	**.01**	**-.06**	**-.01**
Trust in scientists	**-.02**	**-.01**	**-.04**	**-.01**
Trust in God	-.00	.00	-.01	.01
RF Uncertainty				
Negative Emotionality	**.07**	**.02**	**.04**	**.11**
Positive emotionality	.01	.01	-.00	.03
Perceived generalized threat	**.08**	**.02**	**.05**	**.12**
Trust in scientists	.01	.01	-.01	.03
Trust in God	-.00	.01	-.01	.01

**Note.* SE: Standard error; BootLLCI: Bootstrapping lower limit confidence interval; BootULCI: Bootstrapping upper limit confidence interval; RF: Reflective functioning. Significant mediation effects are marked in bold.

In the second model, the direct effect of uncertainty in reflective functioning on conspiracy mentality was also non-significant (see Figure 2). Mentalization uncertainty was positively related to perceived generalized threat and negative emotionality. The amount of variance explained by these associations was low (1.4% for perceived generalized threat and 3.8% for negative emotionality). Mentalization uncertainty was not related to negative emotionality, trust in scientists, or trust in God. In turn, all mediators were significantly linked to conspiracy mentality, which is not surprising given that these paths were the same in both mediation models that we examined. That is, higher positive and negative emotionality, increased perceived generalized threat, higher trust in God and lower trust in scientists predicted more endorsement of conspiracy mentality. Moreover, the indirect effect of mentalization uncertainty on conspiracy mentality was found to be significant through the mediating role of negative emotionality and perceived generalized threat (Table 3). The mediation of both negative emotionality and perceived generalized threat was complementary, i.e., these variables tended to increase the association of mentalization uncertainty with conspiracy mentality. Moreover, since the direct effect of mentalization uncertainty on conspiracy mentality was non-significant, negative emotionality and perceived

generalized threat fully mediated the above relationship. This model explained 12.5% of the variance of conspiracy mentality.

Figure 1. *Direct and indirect effects of reflective functioning certainty on conspiracy mentality through emotionality, perceived generalized threat, and trust*

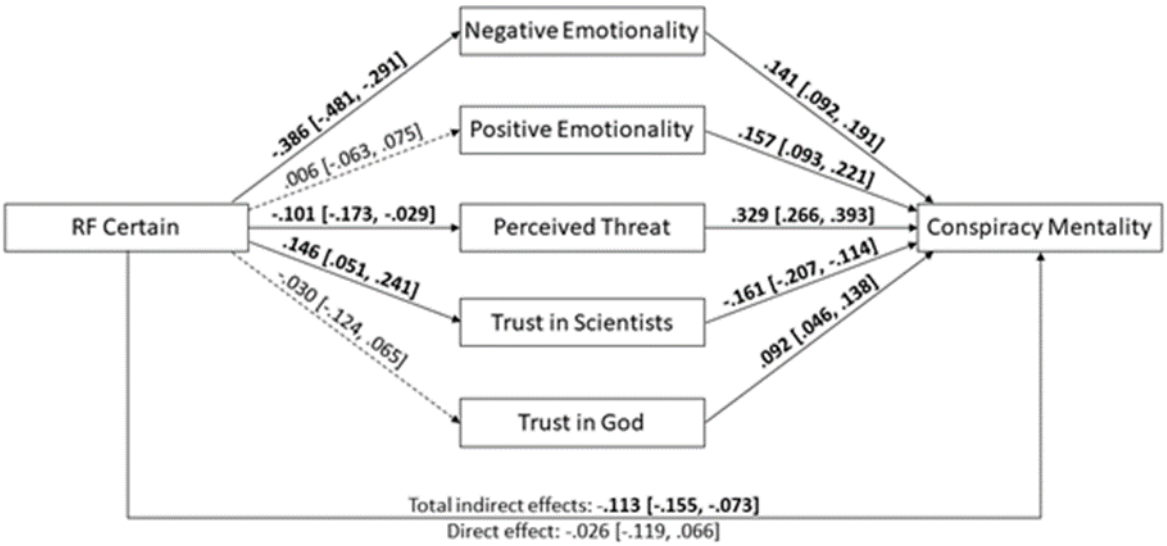
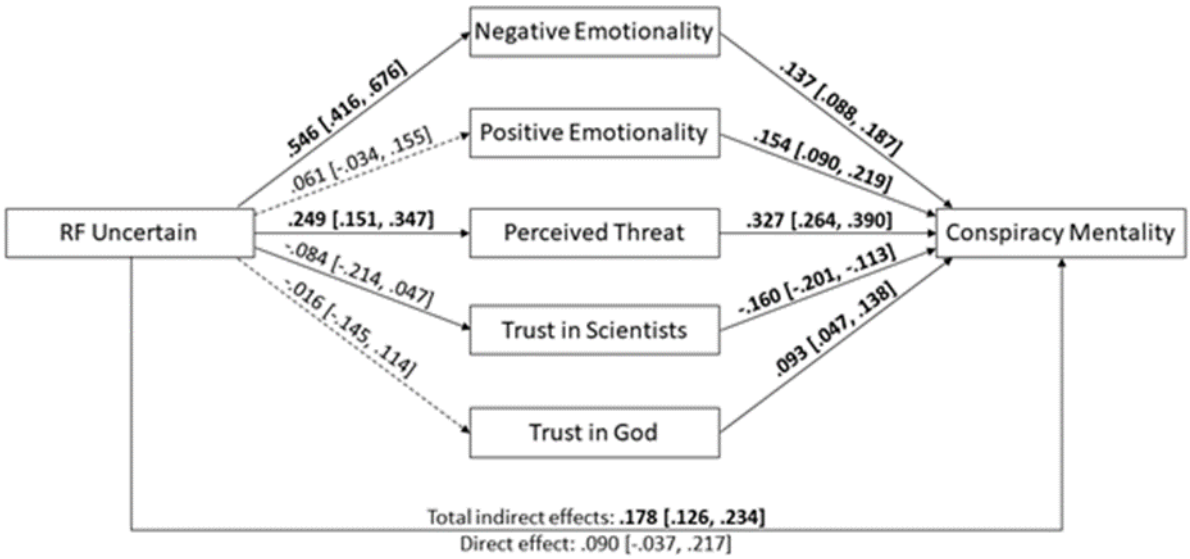


Figure 2. *Direct and indirect effects of reflective functioning uncertainty on conspiracy mentality through emotionality, perceived generalized threat, and trust*



Discussion

The findings of our study indicate that reflective functioning is associated with conspiracy theory endorsement in the expected direction, although the strength of this association is rather low. As the level of reflective functioning increases, the tendency to believe in conspiracy theories to explain the COVID-19 pandemic decreases. Thus, it would seem that the greater the capacity to discern and understand one's own and others' thoughts, feelings, desires, fears, attitudes, and goals, the less one tends to believe in conspiracy mentality to explain the causes of the COVID-19 pandemic. Conversely, the greater the difficulty in identifying one's own and others'

internal mental states, the more likely it is that conspiracy theories are used to explain and understand the COVID-19 pandemic. This is in line with the findings of Sadeghiyeh et al. (2020), namely that the capacity to think analytically and reflectively is linked to low COVID-19 conspiracy theory endorsement.

Our study highlights additional factors as significant mediators in the above relationship. Reflective functioning was found to be associated with negative emotionality, i.e., feelings of fear, sadness and anxiety related to the pandemic. That is, the greater the ability to understand one's own and others' internal states, the less one tends to have negative feelings concerning the COVID-19 pandemic, whereas the more one is unable to understand the mental states of self and others, the more negative feelings one has about the pandemic. Interestingly, reflective functioning was not associated with positive emotionality, that is the experience of positive feelings such as calm or happiness in the context of the pandemic.

Relevant to these findings was the association between reflective functioning in relation to the perception of the pandemic as a generalized threat to multiple targets. Higher levels of reflective functioning, that is the ability to identify one's own and another's internal states, were associated with less of a tendency to see the pandemic as a threat to vulnerable groups such as ethnic minorities, workers in crowded settings or to symbolic targets such as the national economy, the world order, or capitalism.

Moreover, higher levels of reflective functioning were associated with greater trust in scientists. This is to be expected given that epistemic trust is a significant component of reflective functioning (Fonagy & Allison, 2014). Thus, the capacity and willingness to consider information from the external world and to incorporate it into an existing knowledge domain is linked to the individual's ability to trust the information given by scientists regarding the virus. It should be noted, however, that only certainty in reflective functioning was significantly associated with trust in scientists, while uncertainty regarding one's internal state did not predict trust in science. That is to say, the difficulty in understanding oneself and others and in being open to assessing and incorporating reformation was unrelated to the use of scientific information regarding the virus.

With respect to the pattern of associations between belief in conspiracy theories and emotionality, both positive and negative emotions were found to be related to conspiracy theory endorsement. Negative emotionality, that is feelings of anger, sadness, fear, anxiety, or surprise, was more strongly related to conspiracy thinking. This is in line with the results of Fountoulakis et al. (2020) and Kranz et al. (2020) who concluded that higher levels of anxiety, depression, and mental distress correlated with a greater tendency to endorse conspiracy beliefs. Interestingly, in our study, positive emotionality was positively related to conspiracy endorsement as well, although this association was less strong than that between negative emotionality and conspiracy thinking. It should be noted that this finding would not have emerged had we not included positive emotions along with negative ones, which have been the focus of empirical studies to date (Georgiou et al., 2020; Fountoulakis et al., 2020; Kranz et al., 2020). On the basis of our findings, it would appear that individuals who have stronger emotional reactions to the virus, in general, tend to endorse conspiracy theories, perhaps as a way of coping with these emotional reactions. It may also be that positive emotions have a defensive function against negative affect, such as anxiety and depression, and as such they result in the denial of aspects of reality that characterizes conspiracy thinking. This would be in line with our finding regarding the lack of association between reflective functioning and positive emotionality. To be sure, given the scarcity of findings regarding the role of positive emotion and conspiracy thinking in the literature to date, further research is clearly indicated on the role of emotions, especially the positive ones. This is particularly important in terms of the contradictory findings regarding the role of positive emotions in coping with the COVID-19 virus, i.e., that optimistic bias is inversely related to adherence to indicated medical precautions (Park et al., 2021) but positively related to resilience (Sánchez-Teruel & Robles-Bello, 2020), negatively related to anxiety (Biber et al., 2020), acts as a buffer to uncertainty intolerance (Reizer et al., 2021), and mediates the effect of coronavirus stress on psychological problems in adults (Arslan et al., 2020).

Our finding that conspiracy endorsement was predicted by lack of trust in scientists is in line with the findings from a previous COVID-19 study (Pavlopoulos et al., 2021), as well as the findings of other researchers with respect to COVID-19 (Miller, 2020; Plohl & Musil, 2021), and to conspiracy thinking in general (Lewandowsky, 2013). Similarly, the finding that trust in God was associated with conspiracy thinking in the present investigation replicates other findings showing a positive relationship between religiosity and COVID-19 related conspiracy ideation (Freeman et al., 2020; Plohl & Musil, 2021). Finally, we found that as the tendency to see the COVID-19 pandemic as posing a threat of a wider range (that is to vulnerable groups of individuals such as migrants, the poor, healthcare workers as well as to institutions such as capitalism or the Western world) increases, so does the tendency to endorse conspiracy theories. Our results are in some ways at odds with the results of Lithopoulos (2021) who found that the greater the perceived threat, the lower the tendency to endorse conspiracy theories. One difference between that study and ours is that we assessed generalized threat to a series of external objects or institutions whereas Lithopoulos et al. (2021) assessed perceived personal threat, that is the extent to which the individual feels that s/he is at risk for contracting the disease.

Reflective functioning in and of itself was not found to predict conspiracy thinking per se after accounting for emotionality, perceived generalized threat, and trust. Therefore, this prediction is based on the mediation of variables such as emotionality, levels of perceived generalized threat, and levels of trust in science. Where higher levels of reflective functioning are concerned, lower levels of negative emotionality, lower levels of perceived threat, and higher levels of trust in science fully mediate its relationship to conspiracy prediction. In other words, better reflective functioning in and of itself does not affect conspiracy endorsement. Rather, reflective functioning leads to lower negative emotionality, lower level of perceived threat, and higher levels of trust and science, which in turn decrease the tendency to believe in conspiracy theories. Where lower levels of reflective functioning are concerned, this way of internal functioning reinforces negative emotionality as well as a sense of perceived generalized threat, which in turn leads to greater endorsement of conspiracy theory.

Limitations and conclusion

The findings of this study should be best viewed in light of certain limitations. These are inherent to the methodology that was adopted. Statistical associations between variables do not imply causal inferences as we cannot establish causality in a cross-sectional design, which is also why we opted for conducting path analyses instead of testing a structural equation model. Reverse or mutual relationships cannot be ruled out. Such examples could be the associations of conspiracy thinking with reflective functioning and trust in scientists, i.e., whether conspiracy thinking undermines effective mentalization and/or trust in scientists. It would be enlightening for future studies to investigate more complex patterns of relationships, optimally with longitudinal samples. The effect of the reported associations is rather small, and the large sample size may have boosted statistical significance in some cases. Caution is necessary in drawing generalizations from our conclusions since it was not possible to apply random sampling, although the absolute number of participants was more than sufficient. Self-reports on emotional states and abstract concepts, such as reflective functioning, depend heavily on conscious cognitive processes, especially when they are collected remotely in the context of an ongoing extreme health emergency. Replication studies using a longitudinal, mixed methods approach are recommended.

Notwithstanding the above considerations, our findings support the positions recently proposed that reflective functioning has a significant position in the COVID-19 pandemic situation (Lassri & Desatnick, 2020; Poulios et al., 2021; Steele, 2020). Enhancement and support of the ability to identify one's own and others' thoughts, feelings, fears and attitudes, and to be able to consider and evaluate knowledge from the external world leads to greater trust in science, less of a sense of a generalized threat resulting from the COVID-19 pandemic, and less of a tendency to espouse conspiracy theories. Given that endorsement of such theories has been shown to lead to non-adherence to scientifically informed measures, and conversely to engagement in behavioral practices that are dangerous to oneself and others, planning policies should consider ways in which reflective functioning can be cultivated and reinforced in the general public.

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ΕΜΠΕΙΡΙΚΗ ΕΡΓΑΣΙΑ | RESEARCH PAPER

Από την αναστοχαστική λειτουργία στη συνωμοσιολογική σκέψη στην πανδημία COVID-19: Άμεσες και έμμεσες επιδράσεις

Αννα ΧΡΙΣΤΟΠΟΥΛΟΥ[1], Βασίλης ΠΑΥΛΟΠΟΥΛΟΣ[1], Αντώνης ΠΟΥΛΙΟΣ[3], Καλλιόπη ΚΑΡΑΔΗΜΗΤΡΗ[1], Εμμανουήλ ΛΑΓΟΣ[1], Μαρία ΣΤΑΥΡΑΚΑΚΗ[1], Εύα ΣΤΕΦΑΝΑΚΟΥ[1], Κατερίνα ΑΛΕΞΟΠΟΥΛΟΥ[1], Αλεξάνδρα ΜΠΕΚΙΑΡΗ[1], Μάρα ΚΤΕΝΑ[1], Χρήστος ΠΑΝΑΡΙΤΗΣ[1], Χαράλαμπος ΡΙΣΒΑΣ[1], Μελίνα ΤΣΙΟΔΡΑ[1], Βαλέρια ΠΟΜΙΝΙ[2], Ρωσσέτος ΓΟΥΡΝΕΛΗΣ[3]

[1] Τμήμα Ψυχολογίας, Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών
[2] Αιγινήτειο Νοσοκομείο, Ιατρική Σχολή, Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών
[2] Νοσοκομείο «Αττικόν», Ιατρική Σχολή, Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών

ΛΕΞΕΙΣ ΚΛΕΙΔΙΑ

Αναστοχαστική λειτουργία
Συνωμοσιολογική σκέψη
Πανδημία COVID-19
Εμπιστοσύνη
Αντιλαμβανόμενη γενικευμένη απειλή
Συναισθηματικότητα

ΣΤΟΙΧΕΙΑ ΕΠΙΚΟΙΝΩΝΙΑΣ

Άννα Χριστοπούλου
Εθνικό και Καποδιστριακό Πανεπιστήυμιο Αθηνών
Τμήμα Ψυχολογίας,
Φιλοσοφική Σχολή (Κυψέλη 505), Ζωγράφου,
Πανεπιστημιούπολη, 15784,
Αθήνα, Ελλάδα
annachr@psych.oua.gr

ΠΕΡΙΛΗΨΗ

Η πανδημία COVID-19 έχει οδηγήσει σε μεγάλη αύξηση θεωριών συνωμοσίας που χρησιμοποιούνται για να εξηγήσουν αυτήν την κρίση υγείας. Η πίστη σε αυτές τις θεωρίες, με τη σειρά της, έχει σημαντικές επιπτώσεις στη συμμόρφωση με τα μέτρα που έχουν επιστημονική βάση, καθώς και στην αναζήτηση κατάλληλης ιατρικής αντιμετώπισης. Εντούτοις, η προέλευση της συνωμοσιολογικής σκέψης δεν είναι ακόμη πλήρως κατανοητή. Η παρούσα μελέτη διερεύνησε τις άμεσες και έμμεσες επιδράσεις της αναστοχαστικής λειτουργίας στη συνωμοσιολογική σκέψη μέσω του ρόλου της γενικευμένης προσλαμβανόμενης απειλής από τον ιό, της θετικής και αρνητικής συναισθηματικότητας, της πίστης στους επιστήμονες και της πίστης στον θεό σε δείγμα 1.730 Ελλήνων ενηλίκων. Τα αποτελέσματα υποδεικνύουν ότι η αυξημένη ικανότητα αναστοχαστικής λειτουργίας σχετίζεται με μικρότερη πιθανότητα υποστήριξης θεωριών συνωμοσίας. Υψηλότερα επίπεδα αναστοχαστικής λειτουργίας συνδέθηκαν με περισσότερο αρνητική συναισθηματικότητα, χαμηλότερα επίπεδα γενικευμένου προσλαμβανόμενης απειλής, μεγαλύτερη εμπιστοσύνη στους επιστήμονες και λιγότερη εμπιστοσύνη στον θεό. Η ίδια η αναστοχαστική λειτουργία δεν προέβλεψε την υποστήριξη θεωριών συνωμοσίας άμεσα. Εντούτοις, αυτή η σχέση διαμεσολαβήθηκε πλήρως από την αρνητική συναισθηματικότητα, τη γενικευμένη προσλαμβανόμενη απειλή, καθώς και από μεγαλύτερη εμπιστοσύνη προς τους επιστήμονες. Τα ευρήματα αυτά υποστηρίζουν πρόσφατες επιστημονικές τοποθετήσεις σύμφωνα με τις οποίες η αναστοχαστική λειτουργία έχει σημαντικό ρόλο στο πλαίσιο της πανδημίας COVID-19.

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