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Siem, Birte; Kretzmeyer, Benedikt; Stürmer, Stefan

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The role of self-evaluation in predicting attitudes toward supporters of COVID-19-related conspiracy theories: A direct and a conceptual replication of Cichocka et al. (2016)

Birte Siem[1], Benedikt Kretzmeyer,[1] and Stefan Stürmer[1]

Abstract

We examined the role of people's self-evaluation in predicting their attitudes toward supporters of COVID-19-related conspiracy theories by replicating and extending the findings of a study by Cichocka et al. (2016, Study 3) in two preregistered studies (total $N = 1179$). Study 1, a direct replication, confirmed that narcissism and self-esteem—two different sources of people's self-evaluation—differentially predicted their beliefs in a series of well-known conspiracy theories (not related to COVID-19), and served as mutual suppressor variables. Specifically, narcissism was positively related and self-esteem was negatively related to conspiracy beliefs, especially when the respective other predictor was controlled for. Study 2 extended Cichocka's and our Study 1's findings by testing the differential role of self-esteem and narcissism in predicting a COVID-19-specific criterion. Specifically, we focused on people's rejection of supporters of COVID-19 conspiracy theories, a criterion we deem particularly important in curtailing the spread of these theories. Results were generally in line with previous findings, but effects were substantially weaker. As suggested by exploratory analyses, this might be due to the fact that the overall rejection of supporters measure comprises not only items capturing rejection of supporters but also items capturing low beliefs in conspiracy theories. These two distinct components differentially related to self-esteem and narcissism: the differential role of self-esteem and narcissism could only be replicated for the "low belief" subcomponent (thus replicating findings from the original study and from Study 1) but not for the "rejection of supporters" subcomponent. The present work thus contributes to recent research suggesting that low belief in conspiracy theories and the rejection of their supporters might be qualitatively different responses with unique antecedents.

Keywords

self-esteem, narcissism, COVID-19, infectious diseases, conspiracy theories, replication

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The COVID-19 outbreak has rapidly generated various conspiracy theories in the past several months, ranging from beliefs that the COVID-19 pandemic is a hoax to the conviction that the coronavirus had been intentionally created in the lab and had been deliberately released to kill people or to gain political control (e.g., Kouzy et al., 2020; van Mulukom et al., 2020). Importantly, beliefs in such theories and approval of their supporters can play a substantial part in spreading the virus, as they increase the likelihood of an array of risky and antisocial behavior (e.g., ignoring physical distancing appeals, refusing to be vaccinated against COVID-19; e.g., Biddlestone et al., 2020; Imhoff & Lamberty, 2020; Romer & Jamieson, 2020; Teovanović et al., 2020).

With the present research, we seek to contribute to a better understanding of the antecedents of people's attitudes toward supporters of COVID-19-specific conspiracy theories. Specifically, we focus on the predictive role of people's self-evaluation. How individuals evaluate themselves has been investigated as a predictor of their endorsement of conspiracy beliefs in previous research (for an

[1]FernUniversität in Hagen, Germany

Corresponding author:
Birte Siem, Institute for Social Work and Social Pedagogy, Leuphana University Lüneburg, Universitätsallee 1, 21335 Lüneburg, Germany.
Email: birte.siem@leuphana.de

overview, see Goreis & Voracek, 2019). These studies have primarily focused on self-esteem, that is, the belief that one is worthy (Brummelman et al., 2016), as one source of people's self-evaluations, and assumed that people with low levels of self-esteem should be especially prone to endorse conspiracy beliefs. This should be so because these beliefs permit them to blame the conspiratorial actions of powerful others for their problems, thus protecting their self-worth (e.g., Abalakina-Paap et al., 1999). Yet, while some studies show the expected negative relationship between self-esteem and conspiracy beliefs (e.g., Swami et al., 2011), others show no significant relationship (e.g., Stieger et al., 2013). Recent research by Cichocka and colleagues (2016; see also Paulhus et al., 2004) argues that these inconsistent findings could at least partly be explained by the fact that typical measures of self-esteem do not differentiate between secure self-esteem (referred to as self-esteem in the following) and narcissist self-esteem, that is the belief one is superior to others (Brummelman et al., 2016; referred to as narcissism in the following). When it comes to the prediction of people's endorsement of conspiracy beliefs, this distinction is important, because, other than individuals with high self-esteem, narcissists are usually extremely concerned about how they are perceived by others (e.g., Horvarth & Morf, 2009). This heightened awareness of others has been frequently linked to (non-pathological) paranoia, that is a tendency to attribute harmful intentions to other's actions (Raskin & Terry, 1988), which, in turn, is a robust predictor of conspiracy beliefs (e.g., Brotherton & Eser, 2015; Jolley & Paterson, 2020).

Cichocka et al. (2016) thus hypothesized, and found in three studies, that levels of narcissism were positively related to the endorsement of beliefs in well-known conspiracy theories, while self-esteem was negatively related to such beliefs. Importantly, these relationships were especially pronounced when *both* predictors were considered simultaneously, that is, when the variance typical measures of self-esteem and narcissism share with each other was accounted for (mutual suppressor effect). The present research aimed to replicate and extend these findings with a two-step approach. In Study 1, we attempted to directly replicate the central findings observed with a US sample by Cichocka et al. (2016) with a German sample, while Study 2 was a conceptual replication. As the original study, Study 1 focused on beliefs in well-known conspiracy theories but not on COVID-19-related theories. Yet, we consider this direct replication a necessary first step preceding a conceptual replication (Hüffmeier et al., 2016), because it helps identify differences between the original study and the replication studies that might obscure findings from the conceptual replication (e.g., somewhat higher levels of conspiracy mentality in US than in German samples, e.g., Bruder et al., 2013). A successful direct replication in a different national context would thus be especially helpful in case a conceptual replication failed as it would help narrow down the potential reasons for failure. Study 2 was a conceptual replication testing the differential role of self-esteem and narcissism in predicting a COVID-19-specific criterion. Specifically, we focused on people's rejection of supporters of COVID-19 conspiracy theories, a criterion we deem particularly important in curtailing the spread of these theories.

Why focus on rejection of supporters of conspiracy theories?

Extending previous research which mostly focused on people's beliefs in conspiracy theories (e.g., Goreis & Voracek, 2019), we employed the rejection of supporters of COVID-19 conspiracy theories as the central criterion in our Study 2. This distinction is important because, as suggested by different approaches, the active rejection of conspiracy *theorists*, more than only low belief in conspiracy *theories*, should increase the likelihood that people in fact engage in or support actions that effectively curtail the spread of these theories (see also Swami & Barron, 2020).

A first line of research supporting this idea suggests that individuals adopting a stance of active rejection of conspiracy theorists should not only be more immune to the endorsement of conspiracy theories than those who only have low belief in conspiracy theories, but might also help to break their rapid spread. This should be especially relevant for conspiracy theories about highly infectious diseases whose spread is directly related to the spread of the disease itself. For instance, work investigating the specific ways in which conspiracy theories develop (e.g., Sunstein & Vermeule, 2009) assumes that, although in its formation phase a conspiracy theory is likely to be accepted only by those who strongly believe in it, at a later point in time individuals with initially low belief in it might accept it as well, due to growing informational and group pressures. In contrast, those who actively reject these theories, for instance by explicitly condemning these theories and their supporters, or by showing approval of steps that curtail their spread and penalize their supporters, should be more likely to resist informational and social pressures, and might even manage to break the cascade-like spread of these theories.

Another, related, relevant phenomenon is the emergence of so-called echo chambers, which are facilitated through modern communication technology and social media, and are discussed as important drivers of the spread of conspiracy theories, including those about COVID-19 (Pereira et al., 2020; Van Raemdonck, 2020). Such echo chambers are social epistemic structures characterized by their members actively avoiding opposing information, as well as distrusting and discrediting all outside sources (Nguyen, 2020). Importantly, people who show only low belief in conspiracy theories might not only be less immune against these theories in case they "stumble" in

such a chamber (e.g., via social media recommendation algorithms, Törnberg, 2018) than people who adopt a stance of active rejection; they might also more likely decide to leave social networks as soon as they evolve into echo chambers instead of taking action against this development (e.g., through reporting the network)—a form of withdrawal behavior that might ultimately strengthen echo chambers (Sasahara et al., 2021).

Finally, and perhaps most relevant to the present research, work investigating the effects of the identifiability of one's counterpart on subsequent behaviors supports our idea that people's rejection of supporters of COVID-19 conspiracy theories is an especially important criterion in the present context (for an overview, see Kogut & Ritov, 2015). Specifically, this research could show that people are more generous toward specific or identifiable victims rather than toward abstract, global targets (e.g., Small & Loewenstein, 2003), and, in competitive contexts, also more competitive toward identifiable counterparts than toward undetermined counterparts (e.g., Haran & Ritov, 2014). Even more important for the present work is the finding that people also tend to be more punitive toward concrete wrongdoers than toward rather abstract entities, because they experience more anger toward the former (Small & Loewenstein, 2005). Accordingly, one might expect people's rejection of COVID-19 conspiracy *theorists*, who are concrete, identifiable persons, to be a better predictor of their willingness to engage in or to support actions that condemn and punish supporters of conspiracy theories and effectively curtail their spread, than their low beliefs in the *theories* per se, which resemble rather abstract, global identities.

In sum, then, we assume that people's rejection of supporters of COVID-19 conspiracy theories might be the more important variable than their low belief in such theories, not only because taking a stance of active rejection makes them more immune to conspiracy theories, but also because the focus on an opponent in the form of concrete people rather than in the form of abstract theories should be a more important determinant of actions directed at curtailing the spread of these theories. One aim of our work was thus to extend previous research which mostly focused on people's beliefs in conspiracy theories (e.g., Goreis & Voracek, 2019) by investigating how people's self-evaluation relates to the rejection of supporters of COVID-19 conspiracy theories.

Why focus on self-evaluation?

We decided to focus on the predictive value of people's self-evaluation as the central predictor in the present studies for a number of reasons. First, there is good reason to assume that self-esteem plays a significant role in people's rejection of supporters of conspiracy theories. Specifically, in line with previous approaches on the link between self-esteem and conspiracy beliefs (e.g., Abalakina-Paap et al., 1999), endorsing COVID-19-related conspiracy beliefs likely permits people to blame the conspiratorial actions of powerful others for their own problems, disadvantages, or failures. For instance, the belief that the coronavirus had been deliberately created and released by high-power groups to gain political control helps to frame the current situation as yet another example showing that "the government" stops at nothing to keep "the people" from thriving—an idea that is of good use to justify one's own dissatisfying circumstances in self-esteem serving ways. Other people supporting such conspiracy theories validate these views. One might thus expect that people with a rather negative self-evaluation show less rejection (or more approval) of supporters of COVID-19 conspiracy theories, because these supporters prove their own self-serving explanations right.

Second, other than psychopathological antecedents (e.g., *schizotypie*, Barron et al., 2014) that have been in the main focus of past research, the consideration of non-pathological antecedents such as self-esteem and narcissism can help explain why "normal" people believe in conspiracy theories and approve their supporters, and this in almost all societies (see also Goreis & Voracek, 2019; Raab et al., 2013). Even though their prevalence should not be overestimated (Sutton & Douglas, 2020), COVID-19-related conspiracy theories are supported by a substantial proportion of the population (e.g., by approximately one-third of the German population, Schließler et al., 2020). Considering non-pathological predictors such as self-esteem and narcissism might thus be a more fruitful approach to understanding the antecedents of these conspiracy theories than focusing on pathological ones.

Third, probably more than some non-pathological predictors (e.g., political ideologies such as right-wing authoritarianism, Altemeyer, 1988), people's self-evaluation, especially their self-esteem, are responsive to psychological interventions (e.g., Kolubinski et al., 2018; O'Mara et al., 2006). Knowing more about predictors that offer possible routes for effective interventions is especially important when it comes to conspiracy theories about diseases that are highly infectious and can cause serious heath complications such as COVID-19. As noted above, recent research showed that beliefs in COVID-19 conspiracy theories are negatively related to the adherence to safety guidelines aimed at curtailing the spread of the virus and to vaccination intentions (for an overview, see van Mulukom et al., 2020), thus endangering the lives of numerous people. Knowing more about relatively malleable antecedents can thus ultimately help to effectively reduce these life-threatening behaviors.

Another reason for why we focused on self-evaluation is that we deem a replication of particularly Cichocka et al.'s (2016) findings highly relevant. To our knowledge, their research is the only that systematically address the differential (and mutually suppressive) roles of narcissism and self-esteem in predicting conspiracy beliefs, thus contributing to the reconciliation of inconsistent previous findings in this

realm. With the present research we seek to further clarify the role of self-evaluation by attempting to replicate Cichocka et al.'s central findings observed with a US sample in a different national context, namely in Germany. Moreover, while Cichocka et al. focused on beliefs in well-known conspiracy theories but not on conspiracy theories about infectious diseases such as COVID-19 in particular, we aimed to extend their findings by investigating self-esteem's and narcissism's role in predicting a COVID-19-specific criterion, namely people's rejection of supporters of COVID-19 conspiracy theories.

Study 1

In Study 1 (preregistered), we attempted to directly replicate the central findings observed with a US sample by Cichocka et al. (2016) with a German sample. We selected their last study (Study 3, referred to as "C3" in the following) for replication because, in multi-study papers, study quality often rather increases than declines from the first to the last study (Open Science Collaboration, 2015). As the original study, Study 1 focused on beliefs in well-known conspiracy theories but not on COVID-19-related theories. Our assumptions were the same as in Cichocka et al. (2016). Specifically, we predicted that when participants' self-reported levels of narcissism and self-esteem were considered simultaneously as predictors of their belief in well-known conspiracy theories, narcissism should be positively related to their beliefs while self-esteem should be negatively related to their beliefs. Moreover, we assumed a mutual suppression effect, that is, that when considered as separate predictors of beliefs in conspiracy theories, the predictive values of self-esteem and narcissism should be smaller or even nonexistent.[1]

Method

We report how we determined our sample size, all data exclusions, and all measures used in our studies (Simmons et al., 2012). Study materials, preregistrations, data files, and analysis scripts for both studies are openly available under https://osf.io/3ajn4/. In both studies, we used a convenience sample that was recruited primarily via the participant pool of the authors' university. Unless noted otherwise, methods were adopted from C3, who generously provided all necessary information.

Participants and design. An a priori power analysis for the assumed mediation model with narcissism as suppressor variable (based on the size of the indirect effect found in the original study as an estimate and $1-\beta=0.95$ as the desired level of power; see Schoemann et al., 2017) yielded and N of 174. However, to account for a potential overestimation of the effect size in the original data, we decided to achieve an N comparable to that in the original study (516). We thus collected data from 568 participants, anticipating that approx. 10% of participants might have to be excluded from the data set due to our preregistered exclusion criteria (which matched those of the original study). Forty participants had to be excluded because they reported to not live in Germany at the time the study was being conducted.[2] The final sample thus consisted of 528 participants (358 female, 164 male, 6 diverse; M age = 31.40 years, $SD = 12.53$ years), with the majority of participants indicating having a German cultural background (95.64%) and holding a general qualification for university entrance (39.39%) or a university degree (36.17%). The study was of correlative nature.

Procedure. Study 1 closely followed the procedure of C3. The study was conducted online from mid- to the end of March 2020 and was introduced to participants as concerning how they see themselves and how they perceive the world. Participants then worked through a questionnaire that included established measures of the central variables. At the end of the study, participants answered some sociodemographic questions (about their age, gender, cultural background, educational background, country of residence) and were thanked and debriefed. Participants who were psychology students earned course credits.

Measures. For multi-item measures, items were averaged to form a single composite score. We used either established German-language versions of the English-language measures used in C3 or translated them ourselves. Items were coded such that higher values indicate higher levels of the respective construct. As in C3, narcissism and self-esteem scales were presented first and in randomized order; beliefs in conspiracy theories were assessed afterwards.

Narcissism. Narcissism was measured with the German-language version of Raskin and Terry's (1988) Narcissistic Personality Inventory (NPI; Schütz et al., 2004). Participants were presented with 40 pairs of statements (with one statement being nondiagnostic and the other being diagnostic for narcissism; sample item: "I am no better or worse than most people." "I think I am a special person"), and were asked to select the statement for each pair that they feel reflects their personality best. Choices were coded as 1 (*nondiagnostic*) or 2 (*diagnostic*) so that values on this measure can range between 1 and 2 (Cronbach's $\alpha = .83$).

Self-esteem. Self-esteem was measured with the German-language version of Rosenberg's (1965) Self-Esteem Scale (Collani & Herzberg, 2003). Participants rated 10 items (sample item: "On the whole, I am satisfied with myself") on 5-point scales from 1 (*strongly disagree*) to 5 (*strongly agree*) (Cronbach's $\alpha = .89$).

Conspiracy beliefs. Participants' beliefs in a series of globally well-known specific conspiracy theories were

measured with a self-translated version of the 7-item Conspiracist Beliefs Scale (CBS; Douglas et al., 2016). For the translation, we used a team approach modified from the classic back-translation model of Brislin (1970). Participants were asked to indicate on scales from 1 (*strongly disagree*) to 7 (*strongly agree*) to what extent they agree with each of seven statements about prominent conspiracy theories (sample item: "The attack on the Twin Towers was not a terrorist action but a governmental plot"; Cronbach's $\alpha = .84$).

Please note that Study 1 also contained a scale measuring participants' generic conspiracy beliefs, namely the German-language version of the 12-item Conspiracy Mentality Scale by Imhoff and Bruder (2014; Cronbach's $\alpha = .91$), in order to explore whether we can replicate findings with a measure less culture- and time-specific than the CBS. Overall, results from analyses using the generic measure were mostly comparable to those from analyses using the specific measure (though somewhat weaker and partly not significant; see Supplemental Material).

Results

Correlations, means, and standard deviations for all theoretically relevant variables are depicted in Table 1. All analyses reported in the manuscript were conducted using IBM SPSS Statistics 26. Please note that we used one-sided tests to test the preregistered, directional research hypotheses in our replication studies (e.g., Cho & Abe, 2013; Lakens, 2016).

To test the hypothesis of a mutual suppressor effect, that is that levels of narcissism are positively related and levels of self-esteem are negatively related to the endorsement of conspiracy beliefs especially when the respective other predictor is controlled for, we conducted two two-step regression analyses with participants' specific conspiracy beliefs as the criterion. Both regression analyses followed the logic of a mediation model with the predictor entered in a first step and the assumed suppressor (i.e., the mediator) entered as an additional predictor in the second step (MacKinnon et al., 2000). All mediation analyses reported in the paper were conducted using Hayes's PROCESS macro (2018; Model 4, 5000 bootstrap resamples).

Table 1. Intercorrelations, means, and standard deviations (in parentheses) for all theoretically relevant variables (Study 1)

Variable	1	2	3
1. Narcissism	–		
2. Self-esteem	.32**	–	
3. Conspiracy beliefs	.10*	−.09*	–
M	1.33	3.88	2.11
SD	0.16	0.77	1.10

Note: *$p < .05$, **$p < .01$ (two-tailed).

In a first regression analysis, we tested the assumed suppressor effect of narcissism. In a first step, participants' levels of self-esteem were entered as a single predictor into the regression equation ($R^2 = .01$, $F[1, 526] = 4.58$, $p = .033$), and in a second step their levels of narcissism were added as a second predictor ($\Delta R^2 = .02$, $F[1, 525] = 9.30$, $p = .002$; overall $R^2 = .03$, $F[2, 525] = 6.98$, $p = .001$). The results from this analysis generally replicated those of the original study. When considered as a separate predictor in a first step, self-esteem was significantly negatively related to participants' conspiracy beliefs, $B = -0.13$, 90% CI [−0.24, −0.03], $SE = 0.06$, $t(526) = -2.14$, $p = .016$. As expected and indicative of the assumed suppression effect, when self-esteem and narcissism were considered as simultaneous predictors in a second step (i.e., when the overlap between self-esteem and narcissism was adjusted for), self-esteem's negative predictive value increased, $B = -0.20$, 90% CI [−0.30, −0.09], $SE = 0.07$, $t(525) = -3.02$, $p = .001$. The assumed suppression effect of narcissism was further corroborated by an indirect effect analysis confirming that the indirect effect of self-esteem on conspiracy beliefs via narcissism is significant (indirect effect estimate: $B = 0.06$, 90% CI [0.03, 0.10]). In the case of suppression, this means that the inclusion of the assumed suppressor (i.e., narcissism) into the regression equation significantly increased the magnitude of the (negative) relationship between the predictor (i.e., self-esteem) and the criterion (i.e., endorsement of conspiracy beliefs) (see Figure 1a for the corresponding mediation model).

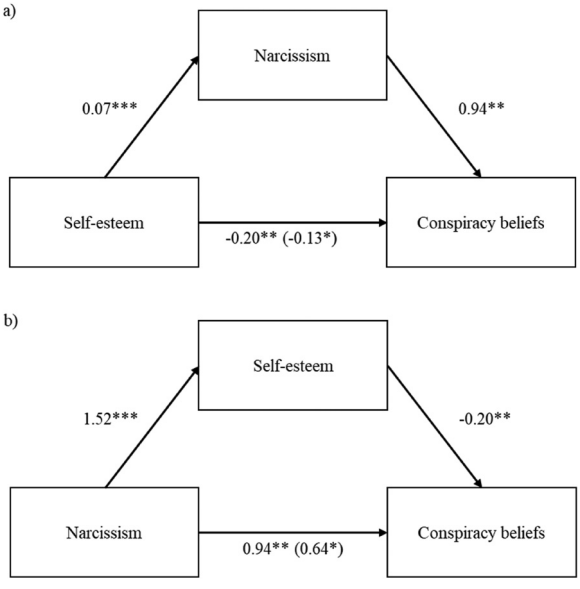

Figure 1. Mediation models testing the assumed suppressor effects of narcissism (a) and self-esteem (b) (Study 1). *Note*: Coefficients are unstandardized regression weights. Total effects are reported in parentheses. *$p < .05$; **$p < .01$; ***$p < .001$ (one-tailed).

An analogous set of regression analyses was conducted to test the assumed suppression effect of self-esteem. When entered in a first step into the regression equation, narcissism was a significant positive predictor of participants' conspiracy beliefs, $B = 0.64$, 90% CI [0.16, 1.13], $SE = 0.30$, $t(526) = 2.18$, $p = .015$ ($R^2 = .01$, $F[1, 526] = 4.76$, $p = .030$). When narcissism and self-esteem were considered as simultaneous predictors ($\Delta R^2 = .02$, $F[1, 525] = 9.12$, $p = .003$), the magnitude of the positive relationship between narcissism and conspiracy beliefs increased, $B = 0.94$, 90% CI [0.43, 1.45], $SE = 0.31$, $t(525) = 3.05$, $p = .001$, indicating that, as in the original study, self-esteem served as a suppressor of the narcissism–conspiracy beliefs relationship. This conclusion was further corroborated by indirect effects analyses showing that the inclusion of self-esteem into the regression equation significantly increased the predictive value of narcissism (indirect effect estimate: $B = -0.30$, 90% CI [−0.49, −0.12]) (see Figure 1b for the corresponding mediation models).

Please note that the general result patterns held up when adjusting for age, gender, cultural background, and education in our analyses.

Discussion

In Study 1, we were able to successfully replicate the findings observed by C3 in a US-based sample with a sample of German residents. When considered separately, narcissism was a significant positive predictor and self-esteem a significant negative predictor of participants' conspiracy beliefs. More important, when considered as simultaneous predictors in a multiple regression analysis, these effects strengthened, indicating that, as in the original study, self-esteem and narcissism served as mutual suppressors in predicting conspiracy beliefs.

Interestingly, the strengths of the predictive values of self-esteem were comparable across our study and the original study (as indicated by an overlap of the CIs of the respective regression weights), while the predictive value of narcissism was stronger in the original study (as indicated by non-overlapping CIs of the respective regression weights). One potential reason for this difference is provided by recent research on measurement invariance of narcissism scales across different countries, suggesting that the NPI (Raskin & Terry, 1988) used in the original and our study does not function equivalently for US and German participants (Wetzel et al., 2021). Still, as the overall pattern could be replicated, we interpret our findings as a successful direct replication of C3.

Study 2

The main aim of Study 2 (preregistered) was to conceptually replicate the findings from Study 1 and from C3 by investigating whether the differential predictive roles of narcissism and self-esteem can also be observed with regard to the rejection of supporters of COVID-19-specific conspiracy theories as the criterion.

Based on the assumption that people who show high beliefs in conspiracy theories are also less likely to reject their supporters, we assumed analogous roles of self-esteem and narcissism. Accordingly, we predicted that self-esteem positively and narcissism negatively relates to rejection of supporters, and this especially when both predictors are considered simultaneously. However, in line with our idea that active rejection of supporters of conspiracy theories and low beliefs in such theories might be qualitatively different responses, we included a number of alternative predictors in our study that are widely recognized in the psychological literature on conspiracy theories and, in addition, might be especially relevant when it comes to predicting the rejection of supporters of COVID-19 conspiracy theories. This allows us (a) to explore whether the predicted effects of self-esteem and narcissism remain when these alternative predictors are considered, and (b) to explore their unique role in predicting the rejection of supporters.

One such predictor is *analytic thinking*, which might be of specific relevance when it comes to the rejection of conspiracy theory supporters: Adopting a stance of active rejection (more than just low beliefs) requires the elaborate weighing of different sources of evidence (Swami & Barron, 2020) as well as the generation of well-thought-out arguments that can be used to convince conspiracy theory supporters. Another potentially important predictor is people's feelings of *anomie*, that is of alienation and disaffection from societal systems (e.g., Bruder et al., 2013; Goertzel, 1994). Anomie might be important for the active rejection of supporters of conspiracy theories, as, in the specific cases of COVID-19-related conspiracy theories, societal systems offer resources that are essential for effectively combating the spread of such theories and their supporters (e.g., laws, police force); feeling connected to a societal system could thus strengthen people's belief that supporters of conspiracy theories can in fact be effectively counteracted. Finally, we considered two political ideologies addressed in previous research on conspiracy theories (e.g., Imhoff & Bruder, 2014): *social dominance orientation*, that is, a preference for hierarchical social systems (SDO; Pratto et al., 1994), and *right-wing authoritarianism*, that is an ideology characterized by a high willingness to submit to authorities, to adhere to societal norms, and to punish people who do not adhere to them (RWA; Altemeyer, 1988). RWA in particular might be a relevant predictor of people's active rejection of supporters of COVID-19 conspiracy theories, as adopting a stance of active rejection is exactly what most authorities (e.g., governments) communicate as an important societal norm to citizens during the pandemic (see also McHoskey, 1995). The role of SDO seems less clear, though. On the one hand, more socially dominant individuals seem to hold

rather negative attitudes toward scientists (see Kerr & Wilson, 2021), something they share with many supporters of COVID-19 conspiracy theories. One the other hand, high SDO individuals often show negative attitudes toward dissident groups (Duckitt & Sibley, 2007). Thus, SDO might be negatively as well as positively related to the rejection of supporters.

Method

Participants and design. An a priori power analysis for the assumed mediation model with narcissism as suppressor variable (based on the size of the indirect effect observed in Study 1 as an estimate and $1-\beta=0.80$ as the desired level of power) yielded an N of 634. Taking into account an approx. 10% of participants might have to be excluded from the data, we aimed for a sample of $N=700$. From the 673 participants[3] who completed our study, we excluded 16 who reported to not live in Germany at the time the study was being conducted. Six additional participants were excluded because they had already participated in Study 1 (identifiable via their pseudonymization code). This led to a final sample of 651 participants (393 female, 255 male, 3 diverse; M age = 41.19 years, $SD=14.34$ years), with the majority of them indicating having a German cultural background (96.77%) and holding a general qualification for university entrance (22.97%) or a university degree (53.46%). The design of Study 2 was correlative.

Procedure. Study 2 (conducted from mid-August to mid-October 2020) closely followed the procedure of C3 and of Study 1, except that participants were presented with additional measures of our alternative predictors (analytic thinking, anomie, SDO, RWA), and with a measure of their rejection of supporters of COVID-19 conspiracy theories.

Measures. Participants of our online study were presented with the same measures of Narcissism (Cronbach's $\alpha=.84$) and Self-Esteem (Cronbach's $\alpha=.90$) as in Study 1.

Anomie. Participants' feelings of anomie were measured with the 9-item Srole Scale adapted by Caruana and Chircop (2002; see also Srole, 1956). For the German-language version, four items could be taken from the German adaptation by Heyder and Gaßner (2014). The remaining five items were self-translated into German language. Participants were asked to indicate on scales from 1 (*strongly disagree*) to 7 (*strongly agree*) to what extent they agree with each of nine statements about alienation in society (sample item: "Most public officials are not really interested in the problems of average people"; Cronbach's $\alpha=.76$).

SDO. We measured SDO with a German Version of the 4-item Short Social Dominance Orientation Scale (SSDO, Pratto et al., 2013). Specifically, participants were asked to indicate on 10-point scales from 1 (*extremely oppose*) to 10 (*extremely favor*) how much they support or oppose the following ideas about groups in general (sample item: "Superior groups should dominate inferior groups"; Cronbach's $\alpha=.64$).

RWA. To measure RWA we used the German-language 9-item short scale KSA-3 (Beierlein et al., 2014) which asks participants to indicate their agreement on 5-point scales from 1 (*strongly disagree*) to 5 (*strongly agree*) to nine statements that tap on the three subcomponents of RWA (with three items each): authoritarian submission (sample item: "We need strong leaders to live safely in society"), authoritarian aggression (sample item: "Social rules should be enforced without compassion"), and conventionalism (sample item: "Established behaviors should not be questioned"). For the purpose of the present study, we averaged all items into a single composite score (Cronbach's $\alpha=.79$).

Analytic thinking. We measured participants' perception of their analytic thinking abilities with the subscale Rational Thinking from the Rational/Experiential Multimodal Inventory (REIm, Norris & Epstein, 2011). The subscale consists of 12 items which were self-translated into German language. Participants were asked to indicate on 5-point scales from 1 (*definitely not true of myself*) to 5 (*definitely true of myself*) how true of themselves 12 statements about thinking styles were (sample item: "I am much better at figuring things out logically than most people"; Cronbach's $\alpha=.81$).

Rejection of supporters of conspiracy theories. Participants were then presented with an 18-item questionnaire recently developed by Swami and Barron (2020) to capture different aspects of people's active rejection of supporters of COVID-19 conspiracy theories. Specifically, they were asked to indicate their agreement with 18 heterogeneous statements, including statements about the condemnation of the people who support and spread COVID-19 conspiracy theories, on 7-point scales from 1 (*strongly disagree*) to 7 (*strongly agree*) (sample item: "People or organizations who share conspiracy theories about the pandemic should be punished in some way"). Items were self-translated into German (Cronbach's $\alpha=.94$).

Results

Correlations, means, and standard deviations for all theoretically relevant variables are depicted in Table 2.

Main analyses

Mutual suppression. To test for the differential predictive roles of narcissism and self-esteem and their mutual suppression effects, we conducted two two-step regression

Table 2. Intercorrelations, means, and standard deviations (in parentheses) for all theoretically relevant variables (Study 2)

Variable	1	2	3	4	5	6	7	8	9
1. Narcissism	–								
2. Self-esteem	.33**	–							
3. Anomie	.02	−.29**	–						
4. SDO	.10**	.04	.13**	–					
5. RWA	.08*	−.07	.28**	.22**	–				
6. Analytic thinking	.23**	.23**	−.16**	.08*	−.11**	–			
7. Rejection of supporters (overall scale)	−.05	.06	−.21**	−.18**	−.01	.05	–		
8. "Low beliefs" subscale	−.07	.11**	−.28**	−.18**	−.12**	.08*	.86**	–	
9. "Rejection of supporters" subscale	−.02	.03	−.14**	−.16**	.05	.02	.96**	.69**	–
M	1.32	4.05	3.43	3.80	2.24	5.01	5.25	5.81	4.78
SD	0.16	0.77	1.03	1.77	0.62	0.56	1.25	1.30	1.44

Note: *$p < .05$, **$p < .01$ (two-tailed).

analyses analogous to those conducted in Study 1, but with participants' rejection of supporters of COVID-19 conspiracy theories as the criterion. Results from these analyses mostly confirmed C3's and our Study 1's findings, though effects were considerably smaller. Specifically, when considered as separate predictors in a first step, neither self-esteem ($B = 0.10$, 90% CI [−0.01, 0.20], $SE = 0.06$, $t[648] = 1.51$, $p = .065$; $R^2 = .004$, $F[1, 648] = 2.29$, $p = .131$) nor narcissism ($B = -0.38$, 90% CI [−0.89, 0.13], $SE = 0.31$, $t[648] = -1.23$, $p = .110$; $R^2 = .002$, $F[1, 648] = 1.50$, $p = .221$) was significantly related to rejection of supporters. When considered simultaneously in a second step, however, self-esteem gained a significant and positive predictive value ($B = 0.14$, 90% CI [0.03, 0.25], $SE = 0.07$, $t[647] = 2.03$, $p = .021$; $\Delta R^2 = .01$, $F[1, 647] = 3.33$, $p = .068$), and narcissism became a significant negative predictor ($B = -0.59$, 95% CI [−1.13, −0.06], $SE = 0.33$, $p = .034$; $\Delta R^2 = .01$, $F[1, 647] = 4.12$, $p = .043$) (overall $R^2 = .01$, $F[2, 647] = 2.82$, $p = .061$). Indirect effects analyses further suggest that self-esteem and narcissism served as mutual suppressors in predicting rejection of supporters (estimate for indirect effect via narcissism: $B = -0.04$, 90% CI [−0.08, −0.01]; estimate for indirect effect via self-esteem: $B = 0.22$, 90% CI [0.03, 0.42]) (see Figure 2a and 2b for the corresponding mediation models).

Alternative predictors. To examine whether the differential predictive values of self-esteem and narcissism remained when controlling for potential alternative predictors of rejection of supporters, we reran these analyses with anomie, SDO, RWA, and analytic thinking as additional predictors. Specifically, we conducted four regression analyses with rejection of supporters as the criterion, and self-esteem and narcissism as well as one of the four alternative predictors as predictor variables (see Supplemental Material for a detailed results report). Results revealed that self-esteem kept its predictive value when simultaneously controlling for potential influences of SDO, RWA or analytic thinking (all three $ps \leq .036$), but was reduced to nonsignificance when controlling for anomie ($p = .348$). Similarly, narcissism kept its predictive value when controlling for RWA and analytic thinking (both $ps \leq .035$), but was reduced to nonsignificance when controlling for SDO or anomie (both $ps \geq .080$).

Of the alternative predictors, anomie and SDO emerged as significant negative predictors in these analyses (both $ps \leq .001$), while RWA and analytic thinking were not significantly related to active rejection of conspiracy theories (both $ps \geq .123$).

Exploratory analyses. Given the visible heterogeneity of the items comprising the measure used to assess rejection of supporters of COVID-19 conspiracy theories, we decided to investigate its factor structure in a set of exploratory

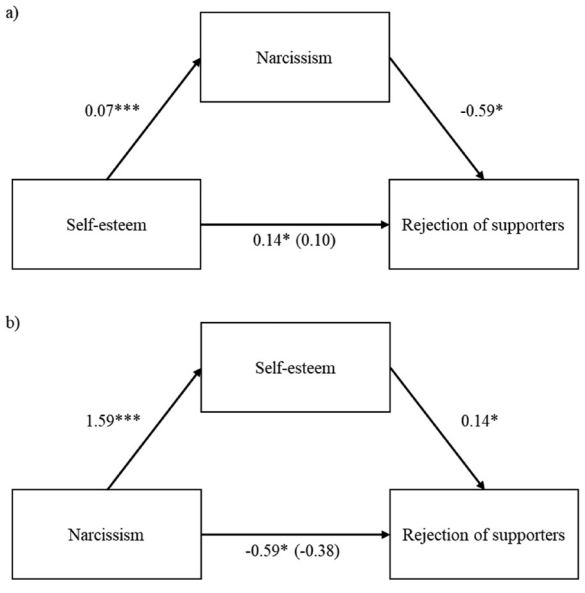

Figure 2. Mediation models testing the assumed suppressor effects of narcissism (a) and self-esteem (b) (Study 2). *Note*: Coefficients are unstandardized regression weights. Total effects are reported in parentheses. *$p < .05$; *** $p < .001$ (one-tailed).

analyses. A principal axis analysis with promax rotation on the 18 items (see also Swami & Barron, 2020) yielded two factors with eigenvalues greater than 1 (1.35, 9.27) that explained 59.02% of the variance. Following recommendations by Comrey and Lee (1992), items were retained when their loadings exceeded .33 and when they showed no crossloadings (i.e., loadings of ≥0.33 on both factors). This analytic strategy suggested a two-factor solution. One subset of nine items showed high loadings (≥0.50) on the first factor and weak loadings (≤|0.28|) on the second factor, and reflects participants' condemnation of supporters of COVID-19-related conspiracy theories, including approval of active steps that penalize supporters (e.g., "I find it disgusting that some people believe conspiracy theories about the epidemic"; "People or organizations who share conspiracy theories about the pandemic should be punished in some way"). A second subset of five items showed weak loadings (≤|0.29|) on the first factor and high loadings (≥0.53) on the second factor and comprises participants' low beliefs in COVID-19-related conspiracy theories (e.g., "Conspiracy theories about the epidemic usually do not make much sense"; "I do not believe any of the conspiracy theories of the pandemic that I have come across") (see Supplemental Material for all factor loadings). It thus seems that the measure not only comprises items capturing the rejection of supporters of COVID-19 conspiracy theories, but also items comprising low beliefs in COVID-19 conspiracy theories. We thus felt justified to build two separate subscales: A 9-item subscale reflecting participants' rejection of supporters (Cronbach's $\alpha = .91$), and a 5-item subscale reflecting low personal beliefs in conspiracy theories (Cronbach's $\alpha = .85$) (see Table 2 for the intercorrelations, means, and standard deviations related to the two subscales).

Fortunately, this two-factor structure allowed us to explore whether analyses with the "low beliefs in conspiracy theories" subscale as the criterion—which is conceptually similar to the criterion used in C3 and in Study 1—could replicate the findings from C3 and Study 1 with stronger effects than the overall measure used in the analyses reported above. For this purpose, we rerun the two-step regression analyses testing the mutual suppression effects of self-esteem and narcissism reported above with either the "low beliefs" or the "rejection of supporters" subscale as criterion.[4] Results from analyses with the "low beliefs" subscale generally resembled those reported above with the overall measure, but effects were in fact considerably stronger and comparable to those observed in C3 and in our Study 1 (see Supplemental Material for a detailed results report). Specifically, as expected, the negative predictive value of narcissism ($p = .097$) and the positive predictive value of self-esteem ($p = .006$) strengthened when these variables were considered as simultaneous predictors (both $ps \leq .006$), and indirect effects analyses further confirmed their mutually suppressive effects (estimate for the indirect effect via narcissism: $B = -0.06$, 95% CI [−0.11, −0.02]; estimate for the indirect effect via self-esteem: $B = 0.39$, 95% CI [0.16, 0.66]).

Results from analyses with the "rejection of supporters" subscale as the criterion, in contrast, showed no indication of a suppression effect. In fact, self-esteem and narcissism were unrelated to this criterion, both when considered as separate or as simultaneous predictors (all four $ps \geq .293$).[5]

Discussion

Our main findings from Study 2 using an overall measure of participants' rejection of supporters of conspiracy theories as criterion were generally in line with the differential predictive values of self-esteem and narcissism observed in C3 and in our Study 1. Moreover, indicating some robustness, the differential effects remained when controlling for the influence of RWA an analytic thinking (but not when controlling for SDO and anomie). The differential effects of self-esteem and narcissism were substantially weaker than in the original study and in our Study 1, though. As suggested by exploratory analyses, this might be due to the fact that the overall "rejection of supporters" measure comprises not only items capturing rejection of supporters but also items capturing low beliefs in conspiracy theories. These two distinct components differentially related to self-esteem and narcissism: While we were able to closely replicate findings from C3 and our Study 1 with comparably strong predictive values of self-esteem and narcissism with the "low beliefs" subscale (which is conceptually similar to the criterion used in C3 and in Study 1), neither self-esteem nor narcissism was a significant predictor of the "rejection of supporters" subscale. It thus seems that the rather weak differential effects of self-esteem and narcissism observed with the overall rejection of supporters measure were primarily driven by the measure's "low beliefs" component. Even more important, people's levels of self-esteem and narcissism seem to be relatively irrelevant when it comes to predicting forms of rejection of supporters of COVID-19-specific conspiracy theories that go above and beyond low beliefs in these theories.

General discussion

The main aim of the present research was to examine the differential roles of people's self-esteem and narcissism in predicting their attitudes toward supporters of COVID-19-specific conspiracy theories. For this purpose, we attempted to directly replicate the central findings observed by Cichocka et al. (2016, Study 3) in a first step (Study 1). Results of this study confirmed in a different national context that individuals' levels of self-esteem and narcissism both were significant antecedents of their beliefs in a series of well-known conspiracy theories, and served as mutual suppressors. In a second step (Study 2), we aimed to

conceptually replicate and extend these findings with people's rejection of supporters of COVID-19 conspiracy theories as the central criterion. Effects of self-esteem and narcissism on the rejection of supporters measure, even though consistent with findings from the original study and our Study 1, were relatively small, though. This might be explained by the fact that the used rejection of supporters measure comprises two components, one reflecting low personal beliefs in COVID-19 conspiracy theories and one reflecting rejection of the theories' supporters. Importantly, while participants' self-esteem and narcissism proved to be significant predictors of their low beliefs (thus replicating findings from the original study and our Study 1 for this component), they were unrelated to their rejection of supporters.

Taken together, these findings contribute to the existing literature on the antecedents of people's attitudes toward conspiracy theories in important ways. First, they add to the clarification of inconsistent previous findings on the role of people's self-evaluations in predicting beliefs in conspiracy theories from past research (see Cichocka et al., 2016, for an overview) by corroborating that self-esteem and narcissism are conceptually distinct sources of self-evaluation (e.g., Brummelman et al., 2016) that can have opposite effects on people's attitudes toward conspiracy theories. Moreover, our research validates that these two predictors serve as mutual suppressors, suggesting that, even if scholars are interested in the predictive role of only one of them, both should be measured so that the shared variance can be accounted for (e.g., Paulhus et al., 2004).

Another conclusion that can be drawn from our findings concerns the distinction between "low beliefs in conspiracy theories" and "rejection of supporters of conspiracy theories." Our research provides preliminary evidence that while people's self-esteem and narcissism seem to be effective predictors of their beliefs in COVID-19-related conspiracy theories, they might be rather ineffective in predicting their active rejection of supporters of such theories. This finding thus adds to a rather novel approach that conceptualizes high beliefs in conspiracy theories and the active rejection of these theories or their supporters not as opposite ends of the same continuum, but as qualitatively different responses that might have unique antecedents each (see also Swami & Barron, 2020).

At this point, the question arises what the specific antecedents of adopting a stance of active rejection of supporters of COVID-19 conspiracies actually are, if not self-esteem and narcissism. To address this question, we conducted an additional set of exploratory multiple regression analyses in which we regressed either the "low beliefs" or the "rejection of supporters" subscale on the four alternative predictors assessed in Study 2 (RWA, SDO, analytic thinking, and anomie; see Supplemental Material for a detailed results report). Interestingly, RWA emerged as the only predictor that was *differentially* related to the two subscales. Specifically, while it was unrelated to the "low beliefs" subscale ($p = .671$), it was significantly and positively related to the "rejection of supporters" subscale ($p = .001$). This finding especially makes sense, when one considers that supporters of COVID-19 conspiracy theories are usually "anti-establishment," portray the government as abusing its power, and try to undermine its authority (see Wood & Gray, 2019). Given that individuals high in RWA are highly willing to take action against people or groups who oppose authorities (e.g., Altemeyer, 1988), they should feel a strong need to demonstrate their rejection of supporters. We acknowledge that this reasoning is based on rather preliminary data and needs to be corroborated in future research, that ideally considers further potential antecedents of people's disapproval and rejection of supporters of COVID-19-related conspiracy theories. As people who actively reject supporters (e.g., by disapproving responses to supporters on social media) might be more likely to encounter negative interactions with supporters than those who disbelieve in a rather passive way (e.g., by staying silent), variables that have been found to predict intervening behavior implicating confrontation and negative social consequences for the self (e.g., moral courage) might be promising candidates here (e.g., individuals' trait moral courage or their agreeableness; Goodwin et al., 2020; Halmburger et al., 2017).

Another limitation of the present research concerns the operationalization of the criterion variable used in Study 2, rejection of supporters of COVID-19 conspiracy theories. Specifically, results from a principal axis analysis let one assume that the scale used in this study (Swami & Barron, 2020) seems to consist not only of items measuring rejection of supporters of COVID-19 conspiracy theories but also of items measuring low beliefs in such theories, suggesting that further validation and scale development steps might be necessary (but see Swami & Barron, 2020, for a one-factor solution). This two-factorial nature of the scale, however, allowed us to explore whether the differential role of self-esteem and narcissism in predicting beliefs in conspiracy theories (not related to COVID-19) observed in C3 and our Study 1 replicated with a measure assessing beliefs in COVID-19 conspiracy beliefs in particular. Further, due to the two-factor structure, we could provide some preliminary evidence that low beliefs in conspiracy theories and rejection of their supporters might be qualitatively different responses with unique antecedents. Still, these findings need to be corroborated in future research, using valid scales of both belief in conspiracy theories and rejection and disapproval of their supporters.

Future research might also address the question of why people's self-evaluation, especially their self-esteem, should affect their endorsement of COVID-19-related conspiracy beliefs and their approval of these theories' supporters. In line with previous approaches (e.g., Abalakina-Paap et al., 1999), we assumed that people with low self-esteem should be especially prone to endorse such beliefs, because they

allow them to blame the conspiratorial actions of powerful others for their problems, and thus to protect their self-worth. For similar reasons, they should approve of those who support the conspiracy theories, and who thus validate their self-serving view. One might think of a number of alternative potential explanations, however. For instance, a social identity approach (Tajfel & Turner, 1979; Turner et al., 1987) suggests that conspiracy theories might offer access to a specific form of social identity to individuals, that is, a membership in an often highly visible and agentic group of conspiracy theory supporters such as the "Querdenker" (lateral thinkers) movement in Germany (see also the concept of opinion-based group memberships; McGarty et al., 2009). Belonging to such a group might be especially appealing for individuals with low self-esteem, as it can provide an alternative source of self-worth (e.g., Greenaway et al., 2016; Jetten et al., 2015). While these processes might apply to conspiracy theories in general, they should be especially relevant during societal crisis events that deprive people of other major sources of self-esteem. The COVID-19 pandemic is such an event: Social distancing, lockdown, and quarantine policies complicate staying in contact with close others, thus limiting intimate friendships' potential as an important source of self-esteem (e.g., Leary & Baumeister, 2000). Moreover, numerous people lost their work during the pandemic, and thereby another major source of self-esteem (e.g., Feather, 1982). Future research should thus take a closer look at the specific psychological processes that link people's self-evaluation to their beliefs in conspiracy theories and their approval of these theories' supporters, and acknowledge that these processes might differ depending on the specific context.

In closing, we wish to address potential practical implications that can be derived from the present research. One barrier that policies that aim at intervening on conspiracy theories face is that people who believe in conspiracy theories are often immune to arguments against these theories (e.g., Carey et al., 2020). It might therefore be necessary to complement intervention approaches based on presenting counter-conspiracy information (e.g., Orosz et al., 2016) with long-term strategies that address the psychological needs that draw people toward conspiracy theories (see Douglas, 2021). One of these needs, the need to feel good about oneself (e.g., Douglas et al., 2019), is at the center of the present research. Specifically, our findings suggest that people with rather low levels of self-esteem (adjusted for levels of narcissism) are more likely to endorse beliefs in conspiracy theories, including those about COVID-19. Increasing people's feelings of self-worth (e.g., through interventions in educational or counselling settings) might thus, in the long run, make conspiracy theories less appealing. However, additional interventions might be needed to increase people's willingness to actively reject or oppose supporters of conspiracy theories. An interesting task for future research would be to investigate whether strengthening competences needed for showing moral courage (e.g., Brandstätter & Jonas, 2012; Halmburger et al., 2017) could be an important building block of such interventions. Taken together, these approaches might provide effective means that help curtail the spread of conspiracy theories, which should be especially vital when the spread of such theories can have severe consequences, as it is the case for conspiracy theories about highly infectious diseases with a potentially severe progression such as COVID-19.

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Open practices statement

Preregistrations, study materials, data files, and analysis scripts for both studies are openly available in the Open Science Framework at https://osf.io/3ajn4/.

Supplemental material

Supplemental material for this article is available online.

Notes

1. In our preregistration of Study 1 and 2, we specified an additional hypothesis that had also been tested in the original study by Cichocka et al. (2016, Study 3). Specifically, we predicted that the effects of narcissism and self-esteem on beliefs in conspiracy theories (Study 1) or on the active rejection of COVID-19-related conspiracy theories (Study 2) would be mediated by generalized negative opinions about people (humanity esteem). As this hypothesis was secondary, and to reduce the complexity of the presentation, we report the corresponding results in the Supplemental Material and not in the main text. The Supplemental Material also contains a description of the humanity esteem measure.
2. In our preregistration, we specified non-serious participation as an additional exclusion criterion, and planned to conduct our analyses with and without participants who reported to not have participated in a serious manner (Study 1: $n = 16$; Study 2: $n = 3$). We decided to report analyses based on the sample including non-serious participations in our paper, as (a) participation seriousness had not been used as a criterion in the original study, and (b) keeping non-serious participants in the sample provided a rather conservative test of our hypotheses. Moreover, analyses with and without non-serious participants yielded comparable results.
3. Please note that we chose (and preregistered) a lower, but still conventional, desired level of power in Study 2 (.80) than in Study 1 (0.95), because we deemed it unrealistic to achieve a sample size necessary for a power of .95 within a reasonable timeframe. Moreover, we stopped data collection in Study 2 in mid-October 2020, slightly before we reached the preregistered N of 700. The main reasons for this decision were a

constant drop of participants (with less than one participant per day in the last week of data collection) and, at the same time, a steeply increasing number of COVID-19 cases in mid-October 2020 (that could have had an unintended influence on participants' responses).
4. Please note that we conducted two-sided tests to test our exploratory assumptions.
5. In an additional set of exploratory analyses, we examined in both studies whether we could replicate our findings using two sub-factors of the NPI (Schütz et al., 2004) that have been suggested by Corry et al. (2008)—"Leadership/Authority" and "Exhibitionism/Entitlement"—instead of the overall NPI score. For Study 1, these analyses generally replicated our findings. For Study 2, we were able to replicate our findings with the "low beliefs" subscale as criterion, but not with the "rejection of supporters" subscale. These additional findings further corroborate the differential role of narcissism and self-esteem and support our assumption that low belief in conspiracy theories and the rejection of their supporters might be qualitatively different responses with unique antecedents.

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