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## Adaptive and maladaptive behavior during the COVID-19 pandemic: The roles of Dark Triad traits, collective narcissism, and health beliefs<sup>☆</sup>



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### ABSTRACT

In a nationally representative sample from Poland ( $N = 755$ ), we examined the relationships between the Dark Triad traits (i.e., psychopathy, Machiavellianism, and narcissism) and collective narcissism (i.e., agentic and communal) on the one hand, and behaviors related to the COVID-19 pandemic at (1) the zero-order level, at (2) the latent variance level, and (3) indirectly through health beliefs about the virus (i.e., the health belief model) on the other. We focused on preventive and hoarding behaviors as common reactions toward the pandemic. Participants characterized by the Dark Triad traits engaged less in prevention and more in hoarding, whereas those characterized by collective narcissism engaged in more hoarding only. Coronavirus-related health beliefs mediated patterns of prevention (fully) and hoarding (partially) in the latent Dark Triad (Dark Core) and collective narcissism. However, specific beliefs worked in opposite directions, resulting in a weak indirect effect for prevention and a null indirect effect for hoarding. The results point to the utility of health beliefs in predicting behaviors during the pandemic, explaining (at least in part) problematic behaviors associated with the dark personalities (i.e., Dark Triad, collective narcissism).

The COVID-19 pandemic presented researchers with an unprecedented opportunity to understand how a physical threat (i.e., the virus) affects people and how people cope with it. One way of coping is by enacting health behaviors (i.e., prevention). Various factors influence the enactment of prevention (Friedman & Kern, 2014), and many such factors undoubtedly apply in the context of COVID-19. However, the pandemic afforded researchers a unique opportunity to re-examine how personality traits relate to adaptive (e.g., washing one's hands) and maladaptive (e.g., overstocking on toilet paper) behaviors, and how these patterns may depend on one's beliefs about the virus. This opportunity was unique, not only because of the novelty and severity of COVID-19, but also because researchers could rely on more direct (or at least less retrospective) verbal reports of behavior.

Most prior research on the relationship between personality and prevention has focused on socially desirable aspects of personality, such as the Big Five traits (i.e., extraversion, openness, emotional stability,

agreeableness, conscientiousness; Friedman & Kern, 2014; Yoshitake, Omori, Sugawara, Akishinonomiya, & Shimada, 2019). Although interesting and important, this focus may have provided an incomplete picture of the role of personality traits in accounting for individual differences in committing health behaviors. Additional traits, such as the Dark Triad (i.e., narcissism, Machiavellianism, psychopathy) and collective narcissism, have attracted less empirical attention, due to their self-oriented character along with their narrowband coverage of the personality space. These traits, however, may have implications for how one copes with the virus (e.g., via adaptive or preventive behavior such as washing hands) and how one's actions entail consequences for others (e.g., via maladaptive behavior such as hoarding supplies). For example, individuals characterized by the Dark Triad traits may be less likely to follow governmentally-enforced restrictions related to COVID-19 (Zajenkowski, Jonason, Leniarska, & Kozakiewicz, 2020). Therefore, we examined how dark personality traits and collective narcissism

<sup>☆</sup> Data availability statement: The data that support the findings of this study are openly available in Open Science Framework repository at [https://osf.io/x54st/?view\\_only=175478ad465643288973d54d6f4c4004&fbclid=IwAR1gc-KQ4A\\_nWzjX9ZyzwPympi4m8\\_9AVhDIUcvxY57MSax\\_kC2Pdn7ZTCQ](https://osf.io/x54st/?view_only=175478ad465643288973d54d6f4c4004&fbclid=IwAR1gc-KQ4A_nWzjX9ZyzwPympi4m8_9AVhDIUcvxY57MSax_kC2Pdn7ZTCQ). The author identifying data will be added once the manuscript is accepted for publication.

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predict health behaviors directly and indirectly through beliefs about the virus.

Given that COVID-19 evokes threats to the self and the group, we were concerned with the role of person-focused and group-focused traits in prevention and health beliefs. Person-focused traits are relevant to the self, whereas group-focused traits are relevant to one's identity as a group member (Sedikides, Gaertner, Luke, O'Mara, & Gebauer, 2013). Also, measures of person-focused traits invite participants to report their opinions of themselves, whereas measures of group-focused traits invite participants to report their opinions of their group (Żemojtel-Piotrowska, Sawicki, & Jonason, 2020). Although there is a wide range of so-called dark traits to consider (Zeigler-Hill & Marcus, 2016), as a rule, these traits are manifestations of self-interests—individual or group; that is, the traits refer to maximizing one's own benefit or one's group benefit, even at the expense of others persons or groups.

For person-focused traits, we considered the Dark Triad (Paulhus & Williams, 2002) of Machiavellianism (i.e., manipulativeness and cynicism), narcissism (i.e., grandiose self-view and sense of entitlement), and psychopathy (i.e., impulsivity and emotional callousness). For group-focused traits, we considered collective narcissism—in its agentic (Golec de Zavala, Cichocka, Eidelson, & Jayawickreme, 2009) and communal (Żemojtel-Piotrowska, Piotrowski, Sedikides, et al., 2020) forms. Agentic collective narcissism refers to strong identification with one's group, unrealistically positive beliefs about the group's potency in the agentic domain (e.g., achievement, competence, dominance), entitlement about the group, and grievance for lack of external recognition. Communal collective narcissism refers to a strong identification with one's ingroup, unrealistically positive beliefs about the ingroup's communality (e.g., friendliness, helpfulness, sacrifice), entitlement about the group's communal value, and grievances for lack of external recognition in the communal domain (Żemojtel-Piotrowska, Piotrowski, Sedikides, et al., 2020). Both collective and grandiose narcissism may be compensatory mechanisms for fragile self-esteem accompanied by a (hyper)sensitivity to threat (Golec de Zavala, 2018; Mollon, 1993). Given that the COVID-19 virus is a threat to people's physical health (Ahorsu et al., 2020), we expected person- and group-focused aspects of dark personality to be related to reactions toward the virus, leading to preventive and hoarding behaviors as manifestations of minimizing perceived danger and maximizing self-interest.

The Dark Triad traits are correlated with various behaviors that affect people's health, suggesting the traits may play a role in responses to the COVID-19 virus. Individuals characterized by the Dark Triad traits are likely to be impulsive (Jones & Paulhus, 2011) and competitive (Jones & Figueredo, 2013), as well as to engage in risky behaviors (Gott & Hetzel-Riggin, 2018)—proclivities that may adversely affect one's health. Indeed, the Dark Triad traits are linked to adverse health outcomes, such as self-reported headaches (Malesza & Kaczmarek, 2019) and a shorter life expectancy (Jonason, Baughman, Carter, & Parker, 2015). In relation to the virus, those higher, for example, in rivalrous narcissism, Machiavellianism, and psychopathy (Factor 1), were less likely to comply with governmental restrictions geared toward reducing the spread of the virus in Poland (Zajenkowski et al., 2020). Therefore, because of the agentic (Jonason & Fletcher, 2018), impulsive (Jones & Paulhus, 2011), nonconformist (Jonason, Koehn, Bulyk, & Davis, 2020), short-sighted (Jonason et al., 2017), and risk-taking (Crysel, Crosier, & Webster, 2013) tendencies of those characterized by the Dark Triad traits, we hypothesized that they would (1) engage in limited prevention but (2) be likely to hoard supplies.

Unlike the Dark Triad traits, which are about the person, collective narcissism is about how exceptional someone feels their group is (in the agentic or communal domain) and how inferior they feel that other groups are (Golec de Zavala, 2018). This disposition translates to hypersensitivity to threats and proclivity for negative emotionality (Golec de Zavala et al., 2019; Golec de Zavala, Cichocka, & Bilewicz, 2013). We contend that these traits are group-focused (Żemojtel-Piotrowska,

Sawicki, & Jonason, 2020). To date, there is no research (we know of) on how collective narcissists protect their health, and there is only limited research on how they react during the pandemic, specifically, by more frequent hand washing (Sternisko, Cichocka, Cislak, & Van Bavel, 2020). Assuming that COVID-19 would act as a threat to one's sense of group superiority (Sternisko et al., 2020; Żemojtel-Piotrowska, Piotrowski, Sawicki, & Jonason, 2020), we hypothesized that it would spur positive associations between collective narcissism and hoarding, but not necessarily between collective narcissism and preventive behaviors. On the other hand, collective narcissists might adopt preventive measures, because they were encouraged to do so by their own government. Support for government could be a reaction to an external threat of the ingroup status quo (Henderson-King, Henderson-King, & Hathaway, 2009).

In general, personality traits are likely to be associated with mechanisms that facilitate adopting certain behaviors in relation to one's health. One of those mechanism may be the beliefs that someone holds about their health (Yoshitake et al., 2019). Put otherwise, traits may be indirectly linked to health behaviors through beliefs. One pertinent theoretical model, the health belief model, proposes five classes of such beliefs: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, and additionally cues to action (Rosenstock, 1974; Rosenstock, Strecher, & Becker, 1988). This model has been applied to the MERS-Cov coronavirus infection (Alsulaiman & Rentner, 2018) to understand compliance with measures recommended by the Saudi Arabian government, a situation resembling the current pandemic. We regarded individual differences in these beliefs as putative mediators between personality traits and health-related behaviors in relation to COVID-19.

In the first half of 2020, people from around the world found themselves in an unprecedented situation. The spread of the COVID-19 virus and the ensuing policies and efforts to restrict its spread placed people in states of existential threat and limited freedom. How people react to these may be related to their personality and beliefs about the virus. In the present study, we focused on the associations between dark personality traits (i.e., the Dark Triad traits and collective narcissism), and health behaviors in relation to COVID-19. In particular, we examined the zero-order correlations, the manner by which shared variance in the Dark Triad traits (i.e., the Dark Core) and collective narcissism may relate to prevention or hoarding, and how these relationships may be mediated by beliefs about the virus.

## 1. Method

### 1.1. Participants and procedure

In a two-wave study (*Wave*<sub>1</sub> *N* = 835; *Wave*<sub>2</sub> *N* = 755), drawing on a Polish community sample, and as part of a larger investigation on attitudes and behaviors during the pandemic, we recruited participants online through the Ariadna research panel (<http://www.panelariadna.com>). Data collection occurred between March 15th and 29th of 2020 (the 3rd and 4th week of governmental restrictions in Poland). Here, we only report data from participants who completed both waves, separated by a week (*N* = 755; 423 women, 332 men) as per guidelines for reducing method bias and participant fatigue (Podsakoff, MacKenzie, & Podsakoff, 2012). These participants were between 18 and 78 years of age (*M* = 45.83, *SD* = 14.98), had a high school (46%) or university (43%) education, and rated their socioeconomic (1 = significantly below average, 7 = significantly above average) status slightly above middle class (*M* = 4.16, *SD* = 1.18). Our sample had adequate power ( $\beta = 0.80$ ) to detect regression coefficients greater than 0.10 (*G\*Power* 3.1.9.4; Faul, Erdfelder, Lang, & Buchner, 2007). The study was approved by the Ethics Committee of the institution of the third and fourth authors (KEiB32/2020). Participants were informed of the nature of the study in each wave, provided implied consent, completed self-report measures that were randomized within wave and within

measure, and were thanked and debriefed upon completion before being remunerated.

## 1.2. Measures

We measured the Dark Triad traits (Wave 2) with the Polish translation (Czarna, Jonason, Dufner, & Kossowska, 2016) of the Dark Triad Dirty Dozen scale (Jonason & Webster, 2010). The scale consists of four items assessing individual differences in psychopathy (e.g., “I tend to lack remorse”), narcissism (e.g., “I tend to seek prestige or status”), and Machiavellianism (e.g., “I tend to manipulate others to get my way”). Participants indicated their agreement with each item (1 = *strongly disagree*, 5 = *strongly agree*). We averaged responses to create indices of each trait.

We measured agentic and communal collective narcissism (Wave 2) with the 9-item Agentic Collective Narcissism Scale (Golec de Zavala et al., 2009) and the 7-item Collective Communal Narcissism Inventory (Żemojtel-Piotrowska, Piotrowski, Sedikides, et al., 2020). Participants indicated their agreement (1 = *definitely disagree*, 7 = *definitely agree*) with statements for the former (e.g., “I wish other groups would more quickly recognize authority of my group”) and the latter (e.g., “My group is extraordinarily friendly toward other groups”). We removed one item (i.e., “If my group had more to say, the world would be a better place”) from the former to reduce redundancy and potential multicollinearity with an item from the latter (i.e., “My group will make the world a better place”). We averaged responses to create indices of each form of collective narcissism.

To measure health beliefs about the COVID-19 virus (Wave 1), we modified (20 items only) the Health Belief scale (Champion, 1984) by substituting the name of the virus (e.g., “The chance that I will get the coronavirus during my lifetime is very high”) in place of other health conditions (e.g., “The chance that I will get the breast cancer during my lifetime is very high”) and created 20-item COVID-19 Health Beliefs scale<sup>1</sup>. The scale captures individual differences in perceived barriers, perceived susceptibility, perceived severity, perceived benefits, and self-efficacy (four items each). Participants indicated how true they believed each item was (1 = *definitely not*, 4 = *definitely yes*).<sup>1</sup> We averaged responses to form the five indices of health beliefs.

We created two ad hoc measures of individual differences in preventive behaviors and hoarding behaviors (Wave 1) regarding the virus (three items each). Participants indicated how likely they were (1 = *definitely not*, 4 = *definitely yes*) to have enacted preventive (i.e., “Decontaminating often touched places [e.g., phone, keys, and door-knobs]; Washing hands more often [e.g., after each return home]; Limiting leaving home without explicit necessity [e.g., to spend time with friends]”) and hoarding (i.e., “Stockpile bigger amounts of food [e.g., flour, milk, eggs, canned goods]; Stockpile more cleaning and disinfecting supplies [e.g., wipes, toilet paper, soap, spirit, etc.]; Stockpile of protective measures [e.g., gloves, masks]”) behaviors during the last week in relation to the coronavirus. We averaged responses to form indices of each type of behavior.

## 2. Results

We present descriptive statistics, Cronbach's  $\alpha$ s, and correlations in Table 1. The skewness and kurtosis for all variables were acceptable

<sup>1</sup> We excluded items assessing cues to action (i.e., internal or external events that affect readiness for action and ignite the decision-making process; Rosenstock, 1974), because this construct was less relevant to the purposes of our study. Specifically, the pertinent items were general (e.g., “I often do exercise”) rather than contextually sensitive, and this is a reason why the variable cues for action is often omitted from research on the health belief model (Champion & Skinner, 2008). Also, internal cues to action are based on observed illness symptoms, and such symptoms were rare during the early stage of the pandemic in Poland, when we collected our data.

(< 1 for skewness, < 2 for kurtosis; George & Mallery, 2010) allowing the use of parametric tests. The Dark Triad traits were associated with more perceived susceptibility and barriers as well as more hoarding, but less preventive behavior. Narcissism was associated with more perceived severity and benefits, psychopathy was associated with more perceived benefits, and psychopathy and Machiavellianism were associated with less self-efficacy. Agentic and communal collective narcissism were positively associated with all five belief types and with hoarding, but not with preventive behavior. We obtained mixed correlations for health beliefs and preventive as well hoarding behaviors.

Given the pattern of correlations and the known mediation effects of health beliefs in the link between personality and health behaviors (Yoshitake et al., 2019), we tested a Structural Equation Model. In this model, we used (1) a Dark Core (indicated by psychopathy, narcissism, and Machiavellianism), collective narcissism (indicated by agentic and communal forms), hoarding behavior (indicated by stockpiling food, hygiene products, and protective products), and preventive behavior (indicated by washing hands, decontaminating frequently used objects, and staying at home) as observed variables, and (2) health beliefs as a putative mediator. We used mPlus with Robust Maximum Likelihood estimation, and relied on common cut-off recommendations for good fit (Byrne, 1994): Comparative Fit Index (CFI) > 0.90, Root Mean Square Error of Approximation (RMSEA) < 0.08, and Standardized Root Mean Square Residual (SRMR) < 0.10.

The model (Fig. 1) fit the data well ( $\chi^2[25] = 80.47, p < .001$ , CFI = 0.98, RMSEA = 0.05, SRMR = 0.03), explaining of 30% of the variance in preventive behavior and 17% of the variance in hoarding. Participants high in the Dark Triad traits were less likely to engage in preventive behavior and more likely to engage in hoarding, whereas participants high in collective narcissism were more likely to engage in hoarding. Reluctance to engage in preventive behavior among those characterized by the Dark Triad traits was partially explained by their health beliefs about COVID-19, especially higher perceived susceptibility, higher perceived barriers, and lower sense of self-efficacy. Participants who perceived barriers as high were less likely to engage in preventive behavior, whereas participants who endorsed all other types of health beliefs were more likely to engage in preventive behavior. However, the apparently protective effect of health beliefs was insufficient to counterbalance the small and negative (albeit not significant) effect of collective narcissism on preventive behavior: Collective narcissism was unrelated to such behavior. Finally, participants who were likely to engage in hoarding were characterized by lower perceived barriers against preventive behavior, and by perceived susceptibility and perceived severity.

## 3. Discussion

We extended work on the relationship between dark personality and health, examining preventive and hoarding behaviors during the COVID-19 pandemic (Sternisko et al., 2020; Zajenkowski et al., 2020). Our study pointed to the utility of the health belief model (Alsulaiman & Rentner, 2018; Rosenstock, 1974; Rosenstock et al., 1988) in predicting such behaviors, with beliefs serving as mechanisms linking personality to engaging in adaptive (i.e., preventive) and maladaptive (e.g., hoarding) preventative measures. We advanced the scope of the model by illustrating the relevance of dark personality traits in predicting both adaptive and maladaptive behaviors in response to the pandemic by person-focused (i.e., the Dark Triad traits) and group-focused (i.e., collective narcissism) personality traits.

As hypothesized, participants characterized by the Dark Triad traits were less likely to engage in preventive behavior and more likely to hoard. Such findings are congruent with details about the fact that people who are high on these traits are more impulsive (Jones & Paulhus, 2011), focus on self-interest (Jonason & Fletcher, 2018), and tend toward risk-taking (Crysel et al., 2013). Participants characterized by collective narcissism were also more likely to engage in hoarding,

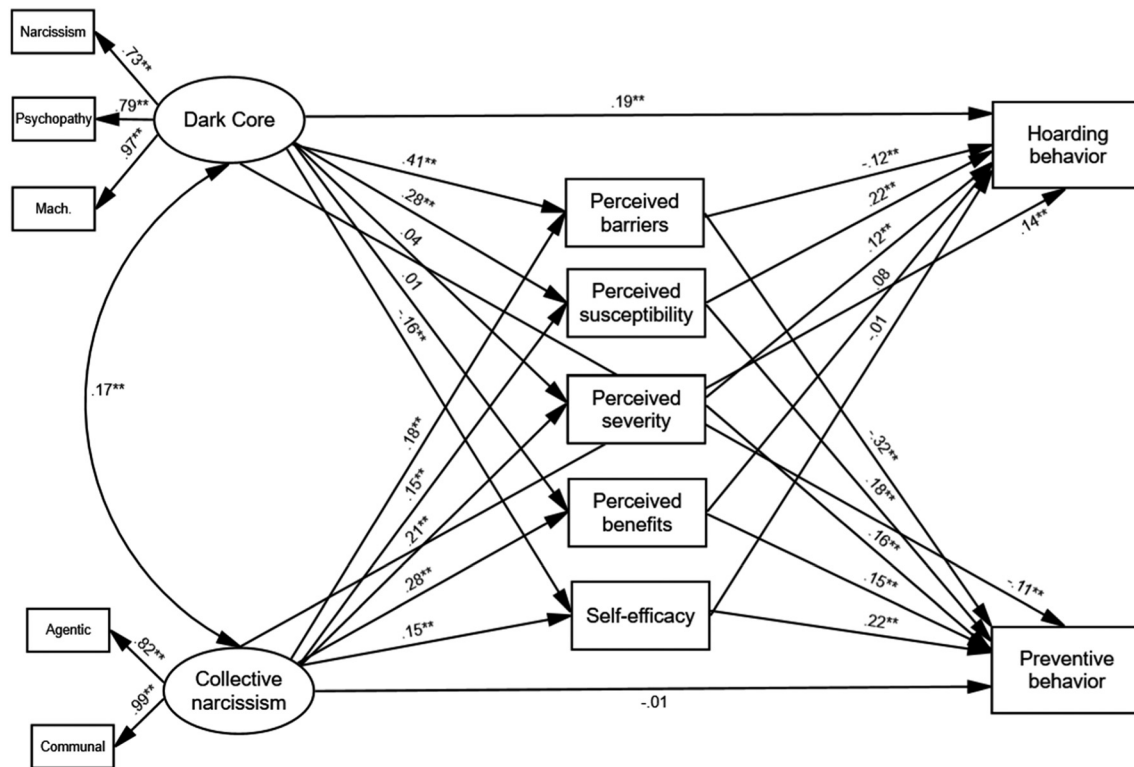
**Table 1**  
Descriptive statistics and zero-order correlations among study variables.

	1	2	3	4	5	6	7	8	9	10	11	12
1. Machiavellianism												
2. Narcissism	.71**											
3. Psychopathy	.76**	.55**										
4. Agentic CN	.11**	.21**	0.03									
5. Communal CN	.16**	.24**	.10**	.81**								
6. Perceived barriers	.42**	.31**	.41**	.19**	.25**							
7. Perceived susceptibility	.29**	.23**	.25**	.19**	.19**	.41**						
8. Perceived severity	0.07	.12**	0.05	.24**	.21**	0.01	.41**					
9. Perceived benefits	0.05	.13**	.06**	.22**	.28**	.19**	0.03	.16**				
10. Self-efficacy	-.13**	-.02	-.12*	.12**	.12**	-.16**	-.11**	.18**	.61**			
11. Hoarding behavior	.23**	.24**	.20**	.18**	.23**	.11**	.31**	.26**	.12**	0.04		
12. Preventive behavior	-.20**	-.09*	-.21**	0.06	0.03	-.30**	0.06	.28**	.24**	.38**	.28**	
Cronbach's $\alpha$	0.91	0.89	0.79	0.91	0.97	0.72	0.76	0.74	0.60	0.58	0.80	0.65
Overall: <i>M</i> ( <i>SD</i> )	2.19 (0.92)	2.50 (0.85)	2.32 (0.78)	4.11 (1.34)	3.79 (1.60)	2.31 (0.75)	2.55 (0.67)	3.29 (0.75)	3.23 (0.63)	3.70 (0.53)	2.19 (0.75)	3.19 (0.59)

Note. CN = collective narcissism.

\*  $p < .05$ .

\*\*  $p < .01$ .



$$\chi^2(25) = 80.47, p < .001, CFI = .98, RMSEA = .05, SRMR = .03$$

**Fig. 1.** Standardized path coefficients in an unconstrained model.

Notes. Mach = Machiavellianism. The total effect of Dark Core on preventive behavior was  $-0.15$  ( $p < .001$ ) and on hoarding was  $0.18$  ( $p < .001$ ). The total effect of collective narcissism on preventive behaviors was  $0.04$  ( $p = .063$ ), and on hoarding was  $0.13$  ( $p < .001$ ). The indirect effect for the Dark Core on preventive behaviors was  $-0.07$  ( $p < .001$ ) and  $0.02$  ( $p = .337$ ) on hoarding. The indirect effects for collective narcissism on preventive behavior was  $0.04$  ( $p < .01$ ) and  $0.04$  ( $p < .01$ ) on hoarding.

\*  $p < .05$ , \*\*  $p < .01$ .

but collective narcissism was unrelated to prevention. Weaker preventive behavior among those characterized by the Dark Triad traits was partially explained by their health beliefs about the coronavirus, and in particular higher levels of perceived barriers against prevention and lower self-efficacy. The Dark Triad traits were also linked to higher perceived susceptibility, yet without endorsing higher levels of perceived severity. Participants higher on the Dark Triad traits seemed to be concerned with negative aspects of prevention and not consider the

benefits of it. Such a concern with perceived barriers was accompanied by lower prevention, which indirectly contributed to lower hoarding. The relationship between health beliefs and behaviors raises the question of motives underlying hoarding and prevention. Participants characterized by the Dark Triad traits may have engaged in hoarding partially for self-protection (Sedikides, 2012), as higher levels of perceived susceptibility were associated with more hoarding. Yet, given that we also found direct effects on hoarding, hoarding may have been



driven by different beliefs than those related to the COVID-19. Collective narcissists engaged in prevention exclusively via their beliefs about the coronavirus. They perceived more barriers against engaging in prevention, but also saw more benefits, and indicated higher self-efficacy, perceived severity, as well as perceived susceptibility, which, in total, were only weakly (albeit significantly) related to higher levels of prevention.

Individuals characterized by higher levels of dark personality traits engaged more in hoarding, yet their beliefs about coronavirus did not play a substantial role in this relationship; that is, in total these beliefs worked in opposite directions. In contrast, individuals characterized by person-focused dark personality traits indicated fewer preventive behaviors both directly and via their higher levels of perceived barriers against prevention and lower perceived self-efficacy in such actions. Further, individuals characterized by group-focused dark personality traits did not differ from others in engaging in preventive behavior. Despite having indicated some adaptive beliefs (i.e., perceived benefits and self-efficacy, but not perceived barriers) about the coronavirus, they did not adopt preventive behaviors.

### 3.1. Limitations

Our study showcased the relevance of dark personality in coping with the threat imposed by the COVID-19 pandemic, and contributed to the literature on the health belief model. The study, though, was limited by its reliance on cross-sectional data, a monocultural sample, and behavioroid (i.e., intentions) measures of health-related behaviors. In addition, most participants declared adopting preventive measures and hoarding behaviors (i.e., negative skew), but this did not violate accepted thresholds for statistical concerns. Also, given that we collected our data at the beginning of the pandemic, such a behavioral pattern seems plausible. Specifically, people may be more likely to engage in prevention and adhere to restrictions in the beginning of the pandemic than two months into the “lockdown”. Indeed, fatigue curves for adhering to the restrictions and engaging in prevention may be a function of dark personality traits.

### 3.2. Conclusion

The management of problematic behaviors may be affected by health beliefs and dispositions. Health beliefs are likely to strengthen the self-protection motive (Janz & Becker, 1984; Rosenstock et al., 1988); here, we observed accompanying behavioral manifestations that are both adaptive (i.e., prevention) and maladaptive (i.e., hoarding). For instance, perceived barriers and perceived severity were associated with increased prevention and hoarding. Perceived barriers were particularly critical for preventive behavior among individuals characterized by high levels of dark traits, and these individuals expressed lower self-efficacy. Such possibly problematic health beliefs, then, could be altered through interventions that would thwart those with dark personalities from some personal and interpersonal costs of the pandemic, encouraging engagement in prevention and the avoidance of hoarding.

### CRedit authorship contribution statement

**Bartłomiej Nowak**: Conceptualization, Methodology, Validation, Visualization, Writing - original draft, Writing - review & editing. **Paweł Brzóska**: Conceptualization, Methodology, Validation, Visualization, Writing - original draft, Writing - review & editing. **Jarosław Piotrowski**: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Software, Supervision, Validation, Visualization, Writing - original draft, Writing - review & editing. **Constantine Sedikides**: Conceptualization, Supervision, Writing - original draft, Writing - review & editing. **Magdalena Zemojtel-Piotrowska**: Conceptualization, Data curation, Funding acquisition, Investigation, Methodology, Project administration, Resources,

Supervision, Validation, Writing - original draft, Writing - review & editing. **Peter K. Jonason**: Conceptualization, Writing - original draft, Writing - review & editing.

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### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.paid.2020.110232>.

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