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## COVID-19 prevention behaviour is differentially motivated by primary psychopathy, grandiose narcissism and vulnerable Dark Triad traits

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### ABSTRACT

Dark Triad traits (psychopathy, narcissism) are associated with nonadherence to COVID-19 prevention measures such as social distancing and wearing face masks, although the psychological mechanisms underpinning this relationship remain unclear. In contrast, high threat-sensitivity may motivate compliance, and maybe seen in relation to vulnerable dark traits (secondary psychopathy, vulnerable narcissism and borderline personality disorder). The relationship between vulnerable dark traits and COVID-19 prevention behaviour has not been examined. During April 2021, participants ( $n = 263$ ) completed an online psychometric study assessing engagement with COVID-19 prevention behaviour, traditional DT traits (primary psychopathy; grandiose narcissism) and vulnerable DT traits. Potential indirect effects were fear of COVID-19, perceived coronavirus severity, belief in COVID-19 conspiracy theories and altruism. Model of path analysis identified predictors of engagement in disease prevention behaviour. Primary psychopathy, grandiose narcissism, secondary psychopathy and BPD were associated with less COVID-19 prevention behaviour, with an indirect effect of reduced coronavirus severity. Grandiose narcissism and BPD were also motivated by COVID-19 conspiracy theories, and increased prevention behaviour when fear of COVID-19 was higher. No direct or indirect effects were observed for vulnerable narcissism. The current study is the first to elucidate psychological mechanisms linking vulnerable dark traits with COVID-19 prevention behaviour.

### 1. Introduction

The Dark Triad (DT) comprises psychopathy, narcissism and Machiavellianism. Psychopathy is characterised by low empathy and impulsiveness, narcissism with superior sense of self and egoism, and Machiavellianism by manipulateness and callousness (Paulhus & Williams, 2002). Whilst the DT has parsimonious utility in explaining psychological phenomena, there are some explanatory limitations because DT traits are multifaceted constructs. Aetiological and manifest differences are evidenced between primary psychopathy (low empathy, callousness and manipulateness) and secondary psychopathy (impulsive, antisocial and neurotic) (Karpman, 1941; Lykken, 1995), and narcissism can be parsed according to grandiose narcissism (self-importance and arrogance) and vulnerable narcissism (inferior sense of self and low self-esteem) (Hart et al., 2017a, 2017b; Wink, 1991). Consequently, the anxious and neurotic features of secondary

psychopathy and vulnerable narcissism were combined with borderline personality disorder (BPD) (which manifests similar features), in the development of an emotionally troubled version of the DT, the vulnerable Dark Triad (Miller et al., 2010). Considering that traditional DT and vulnerable DT traits perform differently across personality and behavioural outcomes (Graham et al., 2011), suggests that it is important to consider both models when investigating psychological phenomena. Furthermore, it is likely that Machiavellianism pertains to primary psychopathy because in studies controlling for Machiavellianism, primary psychopathy remains the explanatory construct (Muris et al., 2017). Thus, the current study seeks to complement the extant literature regarding DT traits (primary psychopathy and grandiose narcissism) and behaviours emerging in the light of the COVID-19 pandemic (e.g., disease prevention behaviour) by additionally considering the vulnerable DT, as yet unexamined in this particular context.

The COVID-19 pandemic and complying with prevention behaviour

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is relevant to DT traits because they are associated with suboptimal health outcomes, which are linked to inadequate health maintenance but potentially for different reasons. This might arise via poor harm reduction behaviour and fear deficits in primary psychopathy (Blair, 1995; Vaurio et al., 2018) or impulsivity and sensation seeking in secondary psychopathy (Lykken, 1995; Waller & Hicks, 2019). Narcissistic individuals also report health problems (Buelow & Brunell, 2014; Hill, 2016), but exhibit resilience and psychological wellbeing when self-esteem is high (Sedikides et al., 2004; Zuckerman & O'Loughlin, 2009), suggesting that these optimal outcomes pertain to grandiose narcissism. Vulnerable narcissism manifests low resilience and mental instability (Sękowski et al., 2021), whilst negative mental and physical health outcomes (Hart et al., 2017a, 2017b; Loeffler et al., 2020) are associated with neuroticism. Thus, if health maintenance is one influential factor for COVID-19 prevention behaviour, grandiose narcissists may be more likely to engage than their vulnerable counterparts.

Prosocial reasons were also motivating factors for COVID-19 prevention behaviour, although they rely on empathy and altruism which may be problematic in the context of dark traits that are deficit in these areas. For example, primary psychopathic individuals adopt utilitarian judgements in moral decision making due to impairment in identifying emotionally with other's suffering (Takamatsu & Takai, 2019). Studies of COVID-19 prevention behaviour show that individuals higher in primary psychopathic traits put others at risk of infection (Blagov, 2020; Zajenkowski et al., 2020). Secondary psychopathic traits could promote similar unethical behaviour. Indeed, antisocial individuals reported less social distancing (O'Connell et al., 2021). Nevertheless, secondary psychopathic individuals are cooperative (Gervais et al., 2013) and could engage in prevention behaviour for the benefit of others. Recent studies also show narcissism contributing to diminished COVID-19 prevention behaviour (Nowak et al., 2020; Zajenkowski et al., 2020). Grandiose narcissists may think they are too important to adhere to restrictions, and anxiety and neuroticism might drive COVID-19 prevention behaviour in non-resilient and shameful vulnerable narcissists (Sękowski et al., 2021) who avoid criticism (van Schie et al., 2021).

BPD individuals report health complications (Long et al., 2017; Trull et al., 2018) caused by impulsivity and risky decision making (Coffey et al., 2011; Saunders et al., 2016), which suggests a potential for inadequate COVID-19 prevention behaviour. Even though BPD involves perceiving the world as hostile and untrustworthy (Niedtfeld & Krosnisen, 2020), intentional flouting of COVID-19 prevention regulations for vindictive reasons is unlikely in BPD due to internalising aggression and sensitivity to criticism and abandonment, whilst general and health anxieties are more likely influential factors (Low et al., 2020).

Another consideration motivating disengagement with COVID prevention behaviour are conspiracy theories, which are linked to the DT (Jolley et al., 2019; March & Springer, 2019). Primary psychopathic individuals believe in conspiracy theories because they assume others to be as manipulative as they are (Douglas & Sutton, 2011). Conspiracy beliefs are negatively related to COVID-19 prevention behaviour (Simione et al., 2021), and primary psychopathy and narcissism are linked to COVID-19 conspiracy beliefs (Gligorić et al., 2021; Hughes & Machan, 2021). Thus, belief in conspiracy theories is a known risk factor for contravening COVID-19 prevention behaviour for high dark traits individuals.

The current study will compare primary psychopathy, grandiose narcissism, and vulnerable DT traits in relation to factors that may influence COVID-19 prevention behaviour. It is expected that because primary psychopathy and grandiose narcissism are associated with reduced fear, low empathy, and belief in conspiracy theories, they will predict decreased fear and perceived severity of COVID-19, reduced altruism, and increased belief in COVID-19 conspiracy theories, which contribute to decreased COVID-19 prevention behaviour. Due to high anxiety and neuroticism, vulnerable DT traits will predict increased fear and perceived severity of COVID-19, contributing to increased COVID-19 prevention behaviour. The direction of the association between

vulnerable DT traits, altruism and belief in COVID-19 conspiracy theories, and their impact COVID-19 prevention behaviour remains open at this stage.

## 2. Method

### 2.1. Participants and procedure

Data were collected in April 2021. Three hundred participants were recruited from Amazon MTurk and paid \$1.50. Due to language proficiency, the survey was limited to participants from the United Kingdom (26 participants) or United States of America (237 participants). A final total of 263 ( $M_{age} = 34.43$ ,  $SD = 11.29$ ; women = 141; men = 118, non-binary = 4) participants were included in the data analyses after removing cases due to missing data or manipulation check fails. The ethnic profile of the cohort was: 192, White; 14, Mixed-race; 20, Asian; 24, Black; and 13 "other".

The study consisted of a series of psychometric questionnaires that took approximately 15 min to complete. Ethical approval was provided by (removed) University's Ethics Committee.

### 2.2. Measures

Primary and secondary psychopathic traits: The Levenson Self-Report Psychopathy (LSRP) scale (Levenson et al., 1995) consists of 26 items (16 for primary psychopathy) ( $\alpha = 0.82$ ) rated on a 4-point Likert scale.

Grandiose narcissism: In the NPI-16 (Ames et al., 2006) ( $\alpha = 0.65$ ) participants are presented with 16 items consisting of two statements and select which one they think applies most to them.

Vulnerable narcissism: Four sub-scales (Reactive anger; Shame; Need for admiration and Distrust) ( $\alpha = 0.62-0.88$ ) of the Five Factor Narcissism Inventory (FFNI) (Glover et al., 2012) are represented by 39 items rated on a 5-point Likert scale.

Borderline personality disorder traits: The Borderline Personality Disorder beliefs scale (Butler et al., 2002) ( $\alpha = 0.89$ ) consists of 14 items measured on a 5-point Likert scale.

Fear of COVID-19: 10 items rated on a 5-point Likert scale up the Fear of COVID-19 scale (Ahorsu et al., 2020) ( $\alpha = 0.82$ ).

COVID-19 variables (Priniski & Holyoak, 2022): Perceived coronavirus severity - 5 items are computed such that a lower score indicates greater severity concern. Item 2 was removed to improve reliability. COVID-19 Conspiracy beliefs consists of 17 items - a higher score represents greater beliefs; COVID-19 Prevention behaviour features 10 items in which a lower score represents greater engagement with hand washing, social distancing and vaccinations. All measures utilised a 5-point Likert scale.

Altruism: The K-SF-42 (Figueredo et al., 2017) features a "general altruism" facet. Six items are rated on a 5-point Likert scale ( $\alpha = 0.71-0.78$ ).

### 2.3. Data analysis

A correlation matrix examined which predictors were associated with COVID-19 prevention behaviour and with each other. Due to multicollinearity concerns, all further analyses were separated according to DT model (i.e., primary psychopathy and narcissism), and then the vulnerable DT (i.e., secondary psychopathy, vulnerable narcissism and BPD).

To establish evidence of mediation between traits and COVID-19 prevention behaviour, two hierarchical regression models were generated in which demographic variables (age, gender, country of origin, education, ethnicity) were added as a first step to remove their variance on the model. For analyses, country was coded as 0 (USA) and 1 (UK). Gender was coded as 0 (female) and 1 (male), with non-binary or blank responses omitted. Respective DT model traits were added in a second

step and potential mediators in a third (Fear of COVID-19, Coronavirus severity, COVID-19 Conspiracy theories and Altruism). If traits were significant predictors in the second step but not when COVID-19 related factors were added in the third, mediation was assumed.

Significant mediators from the hierarchical regression were added to a path analysis involving either primary psychopathy and grandiose narcissism or vulnerable DT traits as predictors and COVID-19 prevention behaviours as the dependent variable. Based on the formula by Kim (2005) approximately 228 participants are needed for an acceptable Comparative Fit Index (CFI) of model fit ( $df = 24$ ,  $\alpha < 0.05$ , 80 % power). Modeling was completed in AMOS SPSS v26. Covariances and error terms based on theoretical justification, modification indices and being exogenous variables. Different tests were used to measure model fit. Values under 0.08 were considered indicative of good fit for the standardized root mean residual (SRMR). The root mean square error of approximation (RMSEA) parsimony adjusted measure is reported with values  $< 0.08$  considered as good fit (Hu & Bentler, 1999). The Tucker Lewis index (TLI) and Comparative Fit Index (CFI) were deemed as acceptable above 0.90 and good above 0.95 (Hu & Bentler, 1999).

Hypothesised indirect effects were tested via bias corrected bootstrapping with 95 % confidence intervals ( $N = 1000$ ) (Tables 2 and 3). For direct effects between variables, standardized betas reported in Figs. 1 and 2. For simplicity, only significant associations between dark triad traits and prevention behaviour and components of indirect pathways are presented. For associations not shown in either figure, see Tables 4 and 5 (Appendix 1).

### 3. Results

Descriptive statistics, Cronbach's alphas and correlations are reported in Table 1.

#### 3.1. Primary psychopathy, grandiose narcissism and COVID-19 prevention behaviour

In a hierarchical multiple regression model of variables predicting COVID-19 prevention behaviour, the impact of demographic variables were controlled for in a first step (adjusted  $r^2 = 0.001$ ,  $p = .370$ ). In the second step (adjusted  $r^2 = 0.159$ ,  $p < .000$ ), primary psychopathy ( $\beta =$

$-0.199$ ,  $p = .007$ ) and grandiose narcissism ( $\beta = -0.273$ ,  $p < .001$ ) were significant predictors. Age was also borderline significant ( $\beta = -0.116$ ,  $p = .052$ ). In a third step, with anticipated mediators added, the model was again significant (adjusted  $r^2 = 0.671$ ,  $p < .000$ ), with coronavirus severity ( $\beta = 0.200$ ,  $p = .001$ ), belief in COVID-19 conspiracy theories ( $\beta = -0.602$ ,  $p < .001$ ) and fear of COVID-19 ( $\beta = 0.109$ ,  $p = .103$ ) as significant predictors but not altruism ( $\beta = 0.028$ ,  $p = .488$ ). Critically, primary psychopathy was no longer a significant predictor ( $\beta = -0.040$ ,  $p = .443$ ), suggesting the presence of mediation. There was no evidence of multicollinearity across any of the models (all VIF  $< 2.76$ ).

A pathway analysis was created based on findings from the hierarchical regression. Because altruism was a non-significant predictor, it was dropped from the path diagram. As age was a borderline significant predictor in the second hierarchical model, it was correlated with all variables in the model to identify if it had any influence on other variables of interest. Where age did have an influence, it was added to the path diagram. Based on theoretical links and modification indices (above 8.0), error terms were added between the two predictor variables and between conspiracy theories and concerns about the severity of COVID-19. The final model was an acceptable to good fit for the data (CFI = 0.982, TLI = 0.926, RMSEA = 0.101, SRMR = 0.037).

The model (Fig. 1) revealed that primary psychopathy was not directly associated with prevention behaviour but there was an indirect association via reduced coronavirus severity (Table 2). Grandiose narcissism also predicted reduced engagement in prevention behaviour via reduced coronavirus severity, and an increased belief in conspiracy theories. Grandiose narcissism predicted increased prevention behaviour when fear of COVID-19 was higher.

#### 3.2. Vulnerable dark triad and COVID-19 prevention behaviour

In a hierarchical multiple regression model of variables predicting COVID-19 prevention behaviour, demographic variables were controlled for in a first step (adjusted  $r^2 = 0.001$ ,  $p = .370$ ). In the second step (adjusted  $r^2 = 0.074$ ,  $p = .001$ ), secondary psychopathy ( $\beta = -0.189$ ,  $p = .034$ ) and BPD ( $\beta = -0.215$ ,  $p = .042$ ) were significant predictors, although vulnerable narcissism ( $\beta = 0.112$ ,  $p = .233$ ) was not. In a third step (adjusted  $r^2 = 0.664$ ,  $p < .000$ ), with anticipated mediators added, coronavirus severity ( $\beta = 0.223$ ,  $p < .001$ ), belief in conspiracy theories

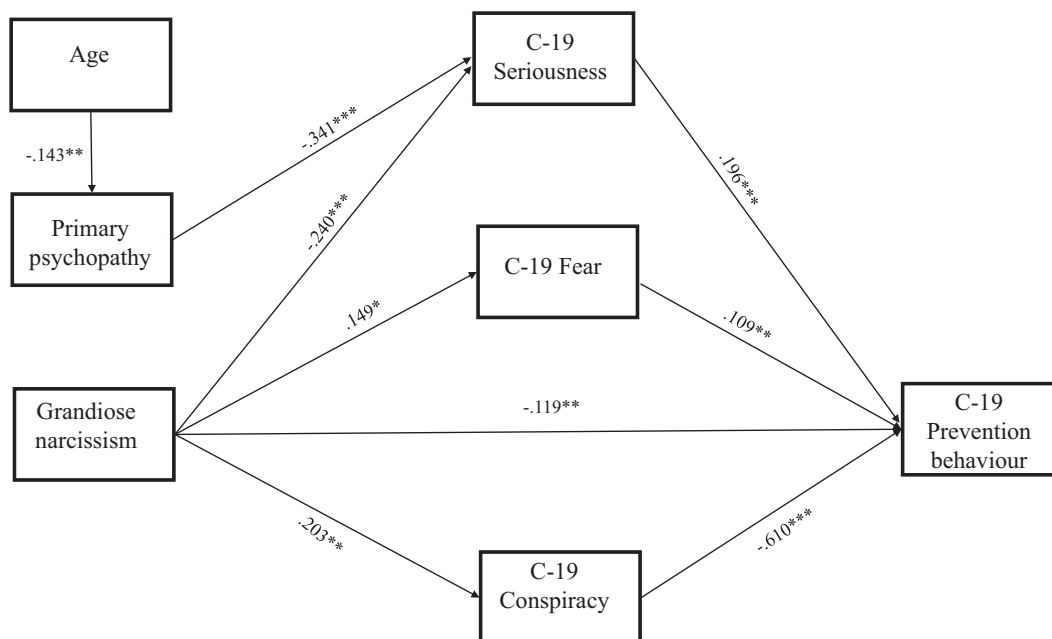
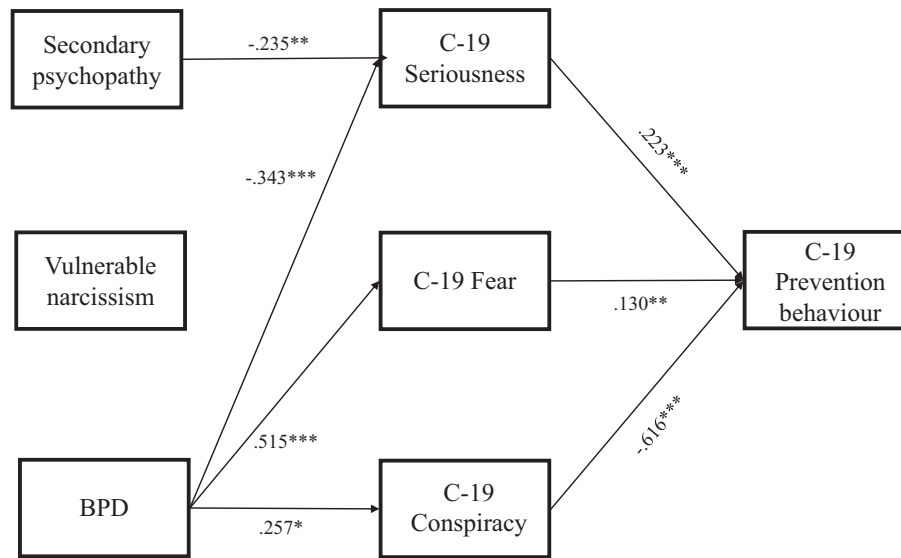


Fig. 1. Results from the path analysis for primary psychopathy and grandiose narcissism. For ease of interpretation, only elements of the significant indirect pathways are presented. Error terms and covariances not visually represented. Values are standardized regression coefficients (\* $p < .05$ , \*\* $p < .001$ , \*\*\* $p < .001$ ).



**Fig. 2.** Results from the path analysis for vulnerable dark triad traits. For ease of interpretation, only elements of the significant indirect pathways are presented. Error terms and covariances not visually represented. Values are standardized regression coefficients. (\* $p < .05$ , \*\* $p < .001$ , \*\*\* $p < .001$ ).

**Table 1**  
Descriptive statistics and zero order correlations for all variables.

Variables	M (SD)	$\alpha$	2	3	4	5	6	7	8	9	10
1. Primary psychopathy (PP)	35.15 (8.87)	0.90	0.61**	0.58**	0.47**	0.62**	0.43**	-0.48*	0.30**	-0.31**	0.12
2. Secondary psychopathy (SP)	23.05 (5.17)	0.77		0.39**	0.62**	0.71**	0.42**	-0.37**	0.25**	-0.24**	0.12
3. Grandiose narcissism (GN)	20.32 (3.33)	0.77			0.24**	0.44**	0.35**	-0.44**	0.31**	-0.36**	0.24**
4. Vulnerable narcissism (VN)	111.31 (24.50)	0.93				0.76**	0.51**	-0.24**	0.11	-0.16**	0.10
5. Borderline personality disorder (BPD)	29.49 (8.99)	0.91					0.60**	-0.38**	0.24**	-0.25**	0.16*
6. Fear of COVID-19	16.64 (7.28)	0.92						-0.12	-0.04	0.06	0.22**
7. Coronavirus severity	15.68 (3.50)	0.71							-0.73**	0.68**	-0.25**
8. COVID-19 Conspiracy beliefs	42.43 (14.74)	0.93								-0.80**	0.25**
9. COVID-19 prevention behaviour (PB)	34.77 (6.22)	0.78									-0.19**
10. Altruism	22.11 (8.66)	0.84									

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

**Table 2**  
Hypothesised indirect effects between primary psychopathy and grandiose narcissism and COVID-19 preventative behaviours.

Associations	$\beta$ (SE)	p	95 % CI
PP → Coronavirus severity → PB	-0.047 (0.020)	.010	-0.084 to -0.016
PP → Conspiracy theories → PB	-0.080 (0.036)	.059	-0.131 to -0.013
PP → Fear of COVID-19 → PB	0.026 (0.009)	.091	0.000 to 0.027
GN → Coronavirus severity → PB	-0.087 (0.043)	.009	-0.162 to -0.031
GN → Conspiracy theories → PB	-0.228(0.076)	.012	-0.354 to -0.104
GN → Fear of COVID-19 → PB	0.030 (0.021)	.018	0.005 to 0.081

( $\beta = -0.610, p < .001$ ) and fear of COVID-19 ( $b = -0.133, p = .008$ ) were significant but not altruism ( $\beta = 0.017, p = .667$ ). Secondary psychopathy ( $\beta = 0.007, p = .892$ ), vulnerable narcissism ( $\beta = -0.072, p = .208$ ) and BPD ( $\beta = -0.069, p = .322$ ) were no longer significant predictors, suggesting the presence of mediation. There was no evidence of multicollinearity across the models (all VIF < 3.68).

A pathway analysis was created based on the output of the hierarchical regression. Altruism was dropped from the model as it was a non-significant predictor in the hierarchical regression. Error terms were added between the three predictor variables and the error terms for fear of COVID and COVID-19 conspiracy theories and between coronavirus severity and COVID-19 conspiracy theories. The final model was an acceptable to good fit for the data (CFI = 0.996, TLI = 0.924, RMSEA = 0.122, SRMR = 0.026).

The path analysis (Fig. 2) revealed that secondary psychopathy was not directly associated with COVID-19 prevention behaviour, but a mediated relationship existed via reduced concerns about the seriousness of the virus (Table 3). BPD was indirectly associated with reduced prevention behaviour via reduced coronavirus severity and increased belief in COVID-19 conspiracy theories. Although increased prevention behaviours in BPD were mediated by increased fear of COVID-19. Vulnerable narcissism was not directly or indirectly associated with prevention behaviour.

**Table 3**  
Hypothesised indirect effects between vulnerable dark triad traits and COVID-19 preventative behaviours.

Associations	$\beta$ (SE)	p	95 % CI
SP → Fear of COVID-19 → PB	-0.004 (0.012)	.744	-0.023 to 0.015
SP → Coronavirus severity → PB	-0.062 (0.029)	.030	-0.116 to -0.017
SP → Conspiracy theories → PB	-0.144 (0.004)	.086	-0.268 to -0.014
VN → Fear of COVID-19 → PB	0.005 (0.003)	.148	-0.001 to 0.010
VN → Coronavirus severity → PB	0.009 (0.006)	.064	0.000 to 0.022
VN → Conspiracy theories → PB	0.032 (0.016)	.051	0.006 to 0.058
BPD → Fear of COVID-19 → PB	0.046 (0.020)	.011	0.015 to 0.080
BPD → Coronavirus severity → PB	-0.052 (0.029)	.010	-0.108 to -0.013
BPD → Conspiracy theories → PB	-0.108 (0.047)	.010	-0.193 to -0.031

#### 4. Discussion

The current study revealed that those higher in grandiose narcissistic traits took the pandemic less seriously and believed COVID-19 conspiracy theories, which contributed to reduced COVID-19 prevention behaviour. Low pandemic severity concern was expected considering that grandiose narcissism is related to arrogance and resilience (Sękowski et al., 2021). Narcissism is linked to COVID-19 conspiracy beliefs (Gligorić et al., 2021), and the current study confirms this pertains to grandiose narcissism. Indeed, an elevated sense of self is the reason for the link between narcissism and belief in conspiracy theories (Cichoń et al., 2017). It is congruent that grandiose narcissists engaged in prevention behaviours when fearful of catching the disease themselves, rather than out of concern for others.

A similar profile was evidenced in BPD as higher BPD scores were associated with reduced prevention behaviour due to individuals taking the pandemic less seriously as well as increased beliefs in COVID-19 conspiracy theories, but those scoring higher in BPD traits also engaged in more prevention behaviours because they were more fearful of COVID-19. These relationships tie into seeing the world as hostile and untrustworthy (Niedtfield & Kroneisen, 2020), as well as impulsivity having a detrimental impact on health outcomes (Coffey et al., 2011; Saunders et al., 2016).

Those higher in primary psychopathic traits and secondary psychopathic traits also took the pandemic less seriously, and consequently reported less COVID-19 prevention behaviour. This is unsurprising considering that primary psychopathy is characterised by glibness (Hare, 2003), which might also explain the lack of a mediating effect of COVID-19 conspiracy theories as that would warrant sufficient interest in the pandemic to explore contrasting viewpoints. Thus, the current study suggests that individuals high in primary psychopathic traits may not only engage in prevention behaviours because of callous motivations in harming others (Blagov, 2020). Secondary psychopathy is associated with impulsivity and sensation seeking (Lykken, 1995; Waller & Hicks, 2019) which may serve as a distraction from considering the severity of

the pandemic. Indeed, in previous research, antisocial teenagers had reported less social distancing (O’Connell et al., 2021). Finally, in contrast to all other traits, vulnerable narcissism was not associated with any COVID-19 factors, which suggests that people high in these traits are occupied by issues they regard as more important, such as the outcomes of their interpersonal situations.

This is a cross-sectional study utilising an Amazon MTurk sample from the UK and US, therefore causality cannot be inferred and cultural factors are not accounted for. The use of psychometric measures and a WEIRD sample (Henrich et al., 2010) limit the scope and generalisability of the findings. Nevertheless, the methods used in the current study allow for theoretical probing of the extant literature. We have demonstrated clear distinctions between primary psychopathy, grandiose narcissism and the vulnerable DT in relation to the COVID-19 pandemic and have addressed previously unconfirmed ideas about why high DT individuals choose not to engage in COVID-19 prevention behaviour.

#### CRedit authorship contribution statement

**Alyson E. Blanchard:** Conceptualization, Data curation, Funding acquisition, Investigation, Methodology, Project administration, Writing – original draft, Writing – review & editing, Visualization. **Greg Keenan:** Formal analysis, Visualization, Writing – original draft, Writing – review & editing. **Nadja Heym:** Formal analysis, Visualization, Writing – review & editing. **Alex Sumich:** Writing – review & editing.

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#### Data availability

Data will be made available on request.

#### Appendix 1

**Table 4**

Direct associations between primary psychopathy (PP) and grandiose narcissism (GN), mediators and COVID-19 prevention behaviours (PB) (unstandardised coefficients).

Association	$\beta$ (SE)	p	95 % CI
PP → Conspiracy theories	0.311 (0.117)	.008	0.049 to 0.491
PP → Coronavirus severity	-0.135 (0.026)	<.001	-0.180 to -0.084
PP → Fear of COVID-19	0.280 (0.056)	<.001	0.200 to 0.380
PP → COVID-19 preventative behaviours	-0.008 (0.034)	.804	0.060 to 0.055
GN → Conspiracy theories	0.889 (0.309)	.004	0.311 to 1.294
GN → Coronavirus severity	-0.252 (0.068)	<.001	-0.390 to -0.157
GN → Fear of COVID19	0.325 (0.148)	.028	0.111 to 0.604
GN → PB	-0.219 (0.084)	.009	-0.380 to -0.011
Conspiracy theories → PB	-0.257 (0.022)	<.001	-0.307 to -0.223
Coronavirus severity → PB	0.344 (0.102)	<.001	0.126 to 0.549
Fear of COVID-19 → PB	0.092 (0.034)	.007	0.031 to 0.146
Age → PP	-0.111 (0.39)	.004	-0.185 to -0.041

**Table 5**

Direct associations between secondary psychopathy (SP), vulnerable narcissism (VN) and BPD, mediators and COVID-19 prevention behaviours (PB) (unstandardised coefficients).

Association	$\beta$ (SE)	p	95 % CI
SP → Conspiracy theories	0.557 (0.239)	.020	0.055 to 0.987
SP → Coronavirus severity	-0.159 (0.055)	.004	-0.255 to -0.042
SP → Fear of COVID-19	-0.039 (0.099)	.694	-0.185 to 0.136
SP → PB	0.031 (0.063)	.619	-0.085 to 0.136

(continued on next page)

Table 5 (continued)

Association	$\beta$ (SE)	p	95 % CI
VN → Conspiracy theories	-0.124 (0.055)	.023	-0.224 to -0.027
VN → Coronavirus severity	0.024 (0.012)	.052	0.001 to 0.046
VN → Fear of COVID19	0.041 (0.023)	.069	-0.006 to 0.079
VN → PB	-0.022 (0.014)	.132	-0.045 to 0.002
BPD → Conspiracy theories	0.417 (0.165)	.012	0.117 to 0.700
BPD → Coronavirus severity	-0.134 (0.038)	<.001	-0.225 to -0.042
BPD → Fear of COVID-19	0.417 (0.069)	<.001	0.301 to 0.531
BPD → PB	-0.035(0.047)	.453	-0.115 to 0.045
Conspiracy theories → PB	-0.259 (0.023)	<.001	-0.299 to -0.219
Coronavirus severity → PB	0.390 (0.098)	<.001	0.192 to 0.592
Fear of COVID-19 → PB	0.109 (0.039)	.005	0.041 to 0.175

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