The dark side of Brazil: Effects of dark traits on general COVID-19 worry and responses against the pandemic

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ABSTRACT

Brazil is one of the epicenters of the COVID-19 pandemic (i.e., 563,470 deaths until August 9th, 2021). Since the Brazilian government is partly struggling and partly unwilling to control the pandemic, staying healthy falls almost exclusively to the population. Therefore, it is crucial to understand the predictive role of personality traits to explain the willingness to combat the COVID-19 virus. In the present study ($N = 496$), we investigated the Dark Pentad traits: Machiavellianism, narcissism, psychopathy, sadism, and spitefulness. Our findings revealed that the first four traits were consistently negatively associated with various measures that indicate whether the pandemic is taken seriously, such as the perceived severity of COVID-19 and intentions to act against COVID-19. Structural equation modeling further showed that general COVID-19 worry mediated the link between the Dark Pentad and adaptive and maladaptive responses. Our results indicate that all dark traits are associated with unsocial behaviors, but their relative importance varies depending on the outcome variable.

1. Introduction

To deal with a global crisis such as the COVID-19 pandemic, people ideally subordinate their own goals to those of the greater good (Wolf, Haddock, Manstead, & Maio, 2020). Sacrifices are therefore inevitable. Unsurprisingly, there are multiple reasons why some people prioritize themselves more than the health of others, including a range of personality variables: lower levels of empathy (Pfattheicher, Nockur, Böhm, Sassenrath, & Petersen, 2020), higher levels of deceitfulness (Miguel, Machado, Pianowski, & de Francisco Carvalho, 2021), and higher levels of the so-called Dark Triad (i.e., Machiavellianism, narcissism, and psychopathy; Nowak et al., 2020; Zajenkowski, Jonason, Leniarska, & Kozakiewicz, 2020) consistently predicted self-centered behaviors, including hoarding or less physical distancing. However, it is unclear whether aversive personality traits are missing that explain unique variance in self-centered behaviors beyond those already measured. Further, the underlying mechanisms are unclear. In the present research, we aim to answer those questions in a large sample of Brazilians.

In the present research, we assess to what extent aversive personality traits can help to explain adaptive (e.g., better hygiene, social distance) and maladaptive (e.g., underestimating the pandemic, hoarding) responses to the pandemic. We focus on aversive traits because they share common aspects, such as antagonism, callousness, and egocentrism, which leads people to care less about others (Paulhus & Williams, 2002). However, it is common in the literature that the connection between traits and behaviors is mediated by 'bridging' variables (Monteiro et al., 2018). For example, Zajenkowski et al. (2020) found that perception of the COVID-19 situation was a stronger predictor of compliance with the COVID-19 regulations than traits. The authors suggested that perceiving the pandemic as a threat results in higher tension and anxiety, predicting compliance with restrictions more strongly than traits. Moreover, being worried of COVID-19 predicts concern about the health of others (Vilar, Liu, Zúñiga, Milojev, & Cannon, 2021) and leads to adaptive behaviors to reduce the spread of the virus (Harper, Satchell, Fido, & Latzman, 2020; Winter et al., 2020). Therefore, the worry of COVID-19 is a proximal variable of behavior that plays a key role in understanding

responses against the pandemic.

Previous studies suggest that the link between traits and compliance behaviors is indirect. For instance, researchers found that personality traits predict situational perceptions (Jonason & Sherman, 2020), and that traits are consistent predictors of being worried of COVID-19 over time (Lippold et al., 2020). Specifically, dark traits are related to reduced fear (McDonald, Donnellan, & Navarrete, 2012) and underestimation of danger (Constantinou, Panayiotou, Konstantinou, Loutsiou-Ladd, & Kapardis, 2011), leading them to be positively associated with risk-taking (Nott & Walker, 2021). Therefore, the present research adds to the literature by examining a process by which personality traits operate via the perception of the COVID-19 situation to influence people on intentions and behavior to comply with measures to contain the COVID-19 spread.

1.1. Dark personality traits and COVID-19

A personality trait is considered dark when, regardless of context and magnitude, it is associated with interpersonal problems and potentially destructive behaviors (Zeigler-Hill & Marcus, 2016). According to Paulhus and Williams (2002), the dark side of personality is composed of three dimensions (Dark Triad): Machiavellianism (e.g., cynical vision of human nature, interpersonal manipulation skills), and subclinical variations of psychopathy (e.g., emotional coldness, reckless, thrill-seekers), and narcissism (e.g., exhibitionism, grandiose and unrealistic sense of self, entitlement). More recently, some researchers (Chabrol, Van Leeuwen, Rodgers, & Séjourné, 2009; Hyatt, Maples-Keller, Sleep, Lynam, & Miller, 2019) argued that sadism (e.g., enjoy watching or making someone suffer; Monteiro et al., 2020) and spitefulness (e.g., harm other people even if you may harm yourself; Marcus, Zeigler-Hill, Mercer, & Norris, 2014) are important variables that describe aspects of the dark side of personality which the Dark Triad does not cover. Those five dimensions can be called the Dark Pentad of personality.

Previous research found significant associations of the dark traits with responsive behaviors towards the pandemic. For instance, individuals with higher levels of dark traits also presented an increase in hoarding behaviors (Nowak et al., 2020), and lower compliance with government restrictions to reduce the spread of the virus (Zajenkowski et al., 2020). Moreover, narcissism, psychopathy, and Machiavellianism are negatively associated with hygiene (Blagov, 2020; Hardin, Smith, & Jordan, 2021). Further, higher levels of Machiavellianism and psychopathy were associated with lower use of social distancing in public situations (Triberti, Durosini, & Pravettoni, 2021). Moreover, individuals with higher levels of psychopathy are more inclined to engage in behaviors that increase the risk of infecting other people (Blagov, 2020).

Finally, sadism is associated with conspiratorial beliefs about COVID-19, and sadists tend to distrust others (Kay, 2020, 2021), which leads them not to believe in the pandemic and not take it seriously, disregarding its effects, and acting in ways that put their own health and the health of others at risk. Moreover, sadists tend to respond to a pandemic with positive affections (Hardin et al., 2021), which goes towards the main characteristic of this trait: to feel pleasure from the suffering of others (Monteiro et al., 2020).

1.2. The present research

The present research tests the impact of the Dark Pentad on adaptive (e.g., better hygiene, social distance) and maladaptive (e.g., underestimate the pandemic, hoarding) compliance responses regarding the COVID-19 restrictions through the situational perception of the pandemic (general pandemic worry). Previous research has focused on the Dark Triad (Hardin et al., 2021; Nowak et al., 2020; Triberti et al., 2021; Zajenkowski et al., 2020) and did not consider the role of other dark traits, sadism, and spitefulness. Moreover, these studies also focused on samples from North American and European countries,

which were better prepared to combat the pandemic than many other nations. In contrast, our research focuses on a sociocultural context conducive to developing aversive traits (e.g., Coelho, Hanel, Monteiro, Vilar, & Gouveia, 2021; Jonason, Okan, & Özsoy, 2019) and self-centered actions (Ferreira, Fischer, Porto, Pilati, & Milfont, 2012): Brazil.

Specifically, corruption, breaking of social norms, and deception are central aspects of the Brazilian culture (i.e., Brazilian Jeitinho; Miura, Pilati, Milfont, Ferreira, & Fischer, 2019), which might create an unpredictable environment (Coelho, Hanel, Monteiro, et al., 2021). Indeed, given that "culture-specific behaviors provide an interesting window into personality expression" (Miura et al., 2019, p. 1) and that dark traits are important adaptive mechanisms in unfavorable socio-ecological conditions (Jonason et al., 2019; Jonason, Icho, & Ireland, 2016), studying dark traits is particularly interesting.

Brazil is one of the COVID-19 epicenters, totaling 563,470 deaths as of August 9th of 2021 (Worldometers, 2021), and the Brazilian government is considered one of the worst in managing the pandemic (The Lancet, 2020), leading the population to prioritize the economy instead of focusing in protecting each other (Coelho et al., 2021). The country has been called an open-air laboratory to assess the proliferation of the virus and the possible development of mutations and more lethal strains (The Guardian, 2020). An example of uncoordinated actions is the Brazilian lockdown: There can be restrictions in a specific city but not in surrounding areas, despite a comparable number of cases. Another instance is a lack of policing: individuals and companies that fail to comply with the containment measures are rarely fined. In other words, self-centered actions are less strictly sanctioned. This uncontrolled context regarding the spread of COVID-19 increases the relevance of understanding the underlying psychological mechanisms that drive individual behavior when people need to take responsibility for their survival.

Based on the research we reviewed above, we formulate the following two hypotheses: (1) All five dimensions of the Dark Pentad are negatively associated with worrying about the pandemic and negatively (positively) with adaptive (maladaptive) responses. (2) Further, worrying about the pandemic will function as an underlying mechanism between the Dark Pentad and (mal-)adaptive responses.

2. Method

2.1. Participants and procedure

Participants were 496 individuals ($M_{age} = 33.3$; $SD_{age} = 11.28$, *range* = 18–71), mostly women (71.9%), single (49.9%), with incomplete higher education (27.9%), and from middle social class (48.5%). Participants were recruited through social media (e.g., Facebook, Instagram, Reddit) and answered the questionnaire online. Before completing the survey, participants provided informed consent, which ensured anonymity and voluntariness. Furthermore, the study followed the ethical guidelines by the 1964 Helsinki declaration and its later amendments.

2.2. Materials

General Worry about COVID-19 was measured with three dimensions. Two of them were adapted from Bults et al. (2011): perceived risk severity (3 items; e.g., Severity of the COVID-19; 1 — *Nothing severe*; 5 — *Very severe*) and perceived anxiety (3 items; e.g., Fear of the COVID-19; 1 — *Not scared*; 5 — *Very scared*). The third dimension assessed concern with the pandemic (4 items; *Considering all the effects that COVID-19 can have on society in general, how concerned are you with the virus?* 1 — *Not at all concerned*; 5 — *Very concerned*; adapted from Stanley et al., 2018). A confirmatory factor analysis revealed an acceptable fit to a three-dimensional structure (CFI = 0.94; TLI = 0.92; RMSEA = 0.096), with composite reliability (CR) ranging from 0.75 (Perceived Severity) to

0.85 (Being concerned).

Maladaptive Responses Against COVID-19 were measured with seven items (e.g., *There is nothing we can do about it;* adapted from Bults et al., 2011). While indicating that this measure covers three components (i.e., underestimation, fatalism, and avoidance), Bults et al. did not provide evidence for validity. Therefore, we performed a Principal Component Analysis (varimax rotation), resulting in the proposed three-factor structure (eigenvalues > 1.0): underestimation (CR = 0.82), fatalism (CR = 0.77) and avoidance (CR = 0.64).

Adaptive Responses Against COVID-19 were measures with 11 items divided into two dimensions, with five items to evaluate intentions to act against the pandemic (e.g., *I do not think about changing my daily habits because of COVID-19*, which was reverse-coded item; 1 — *Totally disagree*; 5 — *Totally Agree;* adapted from Vilar et al., 2021) and six items on the measures taken to avoid contagion (e.g., *Practiced better hygiene*; 1 — *Yes*; 2 — *No;* adapted from Bults et al., 2011). To assess whether the items are adequate to represent COVID-19 adaptive responses, we tested a hierarchical model with two first-order factors and one second-order factor. The DWLS estimator was used because the items had different response scales (dichotomous and polytomous), and the model presented an acceptable fit (CFI = 0.93; TLI = 0.91; RMSEA = 0.040). Re10garding internal consistency, while the first component obtained an acceptable coefficient (CR = 0.69), the second did not (CR = 0.43). This second component consists of a list of behaviors that the individual may or may not have done during the pandemic, each relatively independent of the other. This independence within a component can influence its internal consistency. Note that previous studies on behaviors to avoid COVID-19 contagion do not report the validity or reliability of such items (Miguel et al., 2021). Therefore, knowing the importance of measuring the number of actions people might have done during the pandemic, we decided to keep these items.

2.2.1. Dark Pentad

We use the Dirty Dozen (Jonason & Webster, 2010) to assess Machiavellianism (e.g., *I tend to manipulate others to get my way*), psychopathy (e.g., *I tend to be cynical*), and narcissism (e.g., *I tend to seek prestige or status*). To assess sadism (e.g., *Being mean to others can be exciting*) and spitefulness (e.g., *I would be willing to take a punch if it meant that someone I did not like would receive two punches*), we selected the four items with the highest factor loadings in the studies by Plouffe, Saklofske, and Smith (2017) and Marcus et al. (2014), respectively. All items were answered using a five-point scale (1 — *Totally disagree*; 5 — *Totally agree*). We tested the fit of the five-factor model, which presented acceptable fit (CFI = 0.92; TLI = 0.90; RMSEA = 0.051), with composite reliability ranging from 0.60 (Spitefulness) to 0.78 (Narcissism).

3. Results

Table 1 reports the means, standard deviations, and correlations between dark traits and variables related to COVID-19 (i.e., anxiety, perceived severity, concern, adaptive and maladaptive responses). Descriptive statistics indicate that, in general, people are concerned about the pandemic, intent to act in a way that reduces the spread of the virus, and showing relatively few maladaptive responses, results that are in line with previous research (Nowak et al., 2020; Triberti et al., 2021). Regarding the pattern of association between variables, the Dark Pentad was mainly negatively correlated with anxiety, perceived severity, and concern, supporting Hypothesis 1. Adaptive responses were negatively, and maladaptive responses positively correlated with most of the Dark Pentad dimensions.

Next, we developed through Structural Equation Modeling (SEM; Maximum Likelihood) a model assessing the unique role of each dark trait to explain general worries (anxiety, concern, and perceived severity), which, in turn, are directly predicting adaptive and maladaptive responses to combat COVID-19 (Fig. 1). The model fit was good [χ^2/df = 1.96; CFI = 0.98; TLI = 0.96; RMSEA = 0.044 (90% CI; 0.024–0.063]. People with higher scores in psychopathy ($\lambda = -0.19$; 90% CI $= -0.29$ to -0.10; $p < 0.001$) and sadism ($\lambda = -0.15$; IC90% $= -0.25$ to -0.04, $p = 0.019$) worry less about the pandemic. Also, some traits predict indirectly adaptive (psychopathy, $\lambda = -0.13$; 90% CI $= -0.21$ to $-0.07, p < 0.001$; sadism, $\lambda = -0.10$; IC90% $= -0.18$ to -0.03, $p = 0.018$) and maladaptive (psychopathy, $\lambda = 0.06$; IC90% $= 0.03$ to 0.10, $p < 0.001$; sadism, $\lambda = 0.04$; IC90% $= 0.01$ to 0.08, $p = 0.015$) responses towards the pandemic. Finally, general worries regarding the pandemic directly predicted adaptive ($\lambda = 0.69$; CI90% $= 0.58$ to 0.81, $p < 0.01$) and maladaptive ($\lambda = -0.30$; IC90% $= -0.38$ to -0.22, $p < 0.01$) responses to combat COVID-19. Adaptive responses were also directly predicted by psychopathy ($\lambda = -0.15$; IC90% $= -0.27$ to -0.03, $p = 0.029$) and maladaptive responses were directly predicted by spitefulness ($\lambda = 0.16$; IC90% $= 0.07$ to 0.24, $p < 0.01$).

Additionally, we assessed whether traits directly predict all COVID-19 related variables (general worry, adaptive and maladaptive responses against COVID-19), but the model fit was poor ([χ^2/df = 7.69; CFI = 0.89; TLI = 0.76; RMSEA = 0.11 (90% CI; 0.10–0.13], suggesting that our model reflects the data well, and that there are underlying mechanisms that link personality to responses.

4. Discussion

Brazil is one of the global epicenters of the COVID-19 pandemic. It reported the second-highest number of deaths associated with COVID-19, only behind the USA as of August 2021 (Worldometers, 2021),

Table 1
Correlations between Dark Pentad, general worry and responses to COVID-19.

	M	SD	1	2	3	4	5	6	7	8	9	10
General COVID-19 worry												
1. Concern	4.47	0.62										
2. Perceived severity	4.08	0.75	0.57**									
3. COVID-19 anxiety	4.10	0.94	0.68**	0.48**								
Responses to COVID-19												
4. Intentions to act against COVID-19	4.15	0.61	0.45**	0.34**	0.36**							
5. Measures taken	1.25	0.14	0.29**	0.23**	0.20**	0.26**						
6. Maladaptive responses	2.12	0.51	−0.25**	−0.16**	−0.22**	−0.33**	0.02					
Dark Pentad												
7. Psychopathy	1.69	0.63	−0.24**	−0.14**	−0.19**	−0.29**	−0.14**	0.09*				
8. Machiavellianism	1.56	0.62	−0.18**	−0.11**	−0.14**	−0.23**	−0.12**	0.07	0.51**			
9. Narcissism	2.59	0.89	−0.17**	−0.11**	−0.09*	−0.16**	−0.14**	0.04	0.37**	0.54**		
10. Sadism	1.49	0.59	−0.22**	−0.17**	−0.13**	−0.26**	−0.16**	0.10*	0.50**	0.58**	0.38**	
11. Spitefulness	1.44	0.47	−0.08*	−0.05	0.00	−0.15**	0.04	0.15**	0.40**	0.39**	0.25**	0.46**

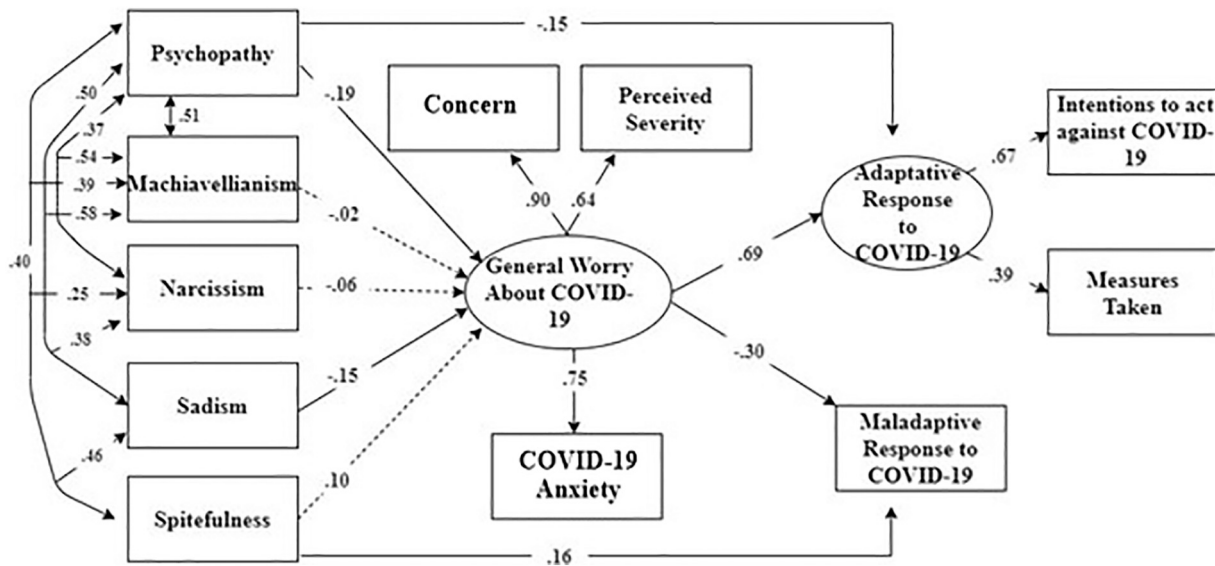* $p < 0.05$.
** $p < 0.01$.

Fig. 1. The role of Dark Pentad and general concerns in explaining actions to combat COVID-19.

resulting in the health system's collapse (Ortega & Orsini, 2020). In the absence of authorities that adequately coordinate actions against COVID-19 and sentence those who ignore them (i.e., relatively weak situational constraints), the Brazilian population is responsible for fighting COVID-19. This makes it even more critical to study personality traits that predict such responses.

Some studies have explored the role of dark personality traits to predict variables related to COVID-19. However, these samples mainly represented WEIRD (Western, Educated, Industrialized, Rich, and Democratic; Henrich, Heine, & Norenzayan, 2010) countries (e.g., Blagov, 2020; Hardin et al., 2021). Extending such studies to non-WEIRD countries such as Brazil is essential for several reasons. For instance, the country presents an unstable environment (Jonason et al., 2019), where substantial corruption and norm-breaking are cultural elements (Miura et al., 2019). These characteristics make the context more conducive for the development of dark traits, which help to understand, to some extent, the chaotic scenes in the country nowadays.

Specifically, among the dark traits, psychopathy and sadism were negatively associated with general worries about the pandemic and positively with maladaptive responses to the pandemic (e.g., stocking food, fatalism thinking about the pandemic), besides not endorsing adaptive responses (e.g., better hygiene, social distancing). These findings go in the same direction as previous studies, that found that people with higher scores in dark traits show fewer preventive behaviors (Nowak et al., 2020), poor hygiene (Hardin et al., 2021), endorse less social distancing, and are more likely to continue living their life as if COVID-19 did not exist (Triberti et al., 2021), thus putting themselves and others at risk (Blagov, 2020). However, our findings also suggest that dark traits can buffer against worries (cf. Lyons et al., 2019).

Psychopaths underestimate risks (Constantinou et al., 2011), are reckless, impulsive, and thrill-seekers (Patrick, Fowles, & Krueger, 2009). Such characteristics of psychopaths can help to understand why psychopathy was positively associated with maladaptive responses in our sample. Psychopaths believe in conspiracy theories about COVID-19 (e.g., claiming that there is no hard evidence that COVID exists; Hughes & Machan, 2021), which partially explains the lack of concern about the severity of the situation. Further, as outlined in the Introduction, sadists tend to respond to a pandemic with positive affections (Hardin et al., 2021), which goes towards the main characteristic of this trait: to feel pleasure from the suffering of others (Monteiro et al., 2020). Therefore, sadists do not engage in actions to combat the pandemic as they enjoy the misfortune of others.

A negative trait that had not yet been explored in the context of the COVID-19 pandemic is spitefulness. Spitefulness was not associated with concerns about the pandemic, but it was positively and more strongly associated with maladaptive responses than the other four dark traits. This is in line with the central aspect of spitefulness: harming other people even if it means harm for oneself (Marcus et al., 2014).

It is worth noting some limitations of the present study, such as the non-probabilistic nature of the sample, which makes generalizations unfeasible and the sensitivity of the measures to social desirability (i.e., people are expected to behave in a way that prevent the spread of COVID-19 and score low on dark traits). Further, we have not asked participants to what extent the pandemic has impacted their life (e.g., whether they became unemployed). This might moderate the association between dark traits and maladaptive responses: People whose life was negatively impacted and score high on the Dark Pentad might report the highest levels of maladaptive responses.

Despite these limitations, the present study builds on the literature exploring the dark side of personality in understanding pandemic-related variables. Nevertheless, future studies are necessary to explore different underlying mechanisms between dark traits and behavior. For example, it is unclear why the dark traits are associated with the intention not to get vaccinated (Hughes & Machan, 2021): is it conspiracy beliefs, belief in one's superiority, or the enjoyment of seeing the suffering of others for a bit longer, for example? Understanding which personality traits are related to adaptive and maladaptive responses and how they are related is fundamental for public health communication, as it helps to design more appropriate actions based on specific individual characteristics (Blagov, 2020).

CRediT authorship contribution statement

Renan P. Monteiro: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Software, Supervision, Visualization, Writing – original draft, Writing – review & editing. **Gabriel Lins de Holanda Coelho:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Software, Supervision, Visualization, Writing – original draft, Writing – review & editing. **Paul H.P. Hanel:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Software, Supervision, Visualization, Writing – original draft, Writing – review & editing. **Roosevelt Vilar:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project

administration, Software, Supervision, Visualization, Writing – original draft, Writing – review & editing. **Valdiney Veloso Gouveia:** Project administration, Writing – review & editing. **Emerson Diogenes de Medeiros:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Software, Supervision, Visualization, Writing – original draft, Writing – review & editing.

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