



# To vaccinate or not to vaccinate? The role of personality

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## ABSTRACT

This article presents findings on the personality traits of individuals who identified as either Vaxxers (V) or Anti-Vaxxers (AV) during the COVID-19 pandemic. The study administered measures of Dark Triad traits (Machiavellianism, Narcissism, and Psychopathy), trait emotional intelligence, and personality to a sample of 479 participants (283 Vs and 196 AVs) recruited via mTurk. Results indicated that Vaxxers scored higher on HEXACO Honesty and Conscientiousness while Anti-Vaxxers scored higher on the Dark Triad and trait emotional intelligence. These findings contribute to the understanding of personality differences between Vaxxers and Anti-Vaxxers during a public health crisis.

## 1. Introduction

During the COVID-19 pandemic, one major controversy that arose concerned vaccinations. Two distinct sides were present in this controversy: Vaxxers (V), individuals in favor of receiving vaccinations, and Anti-Vaxxers (AV), individuals opposed to vaccinations.<sup>1</sup> Some previous research has investigated personality traits in Vs and AVs. Choi et al. (2022) looked at the Big 5 personality traits and determined that Extraversion, Openness, Conscientiousness, and Agreeableness were all higher in individuals more compliant with COVID-19 restrictions. Lin and Wang (2020) reported that individuals who scored higher in Conscientiousness and Agreeableness had a more positive attitude towards vaccinations. In a related vein, Hughes and Machan (2021) investigated the Dark Triad of Machiavellianism, Narcissism, and Psychopathy with reference to conspiracy theories related to COVID-19. They found that individuals with elevated levels of Machiavellianism and Psychopathy were more likely to endorse COVID-19 conspiracy theories.

Our study was exploratory in nature, implementing a design that utilized two identical questionnaires, specifically aimed at recruiting participants from the V and AV groups. We incorporated constructs that have not been extensively researched in this context before. More specifically, we focused on the Dark Triad, the HEXACO model of personality (including its Honesty/Humility dimension) and trait emotional intelligence (trait EI). The latter is defined as a constellation of

emotional perceptions measured via questionnaires and rating scales and comprises four factors: Well-being, Self-control, Emotionality, and Sociability (Petrides et al., 2007). The inclusion of this construct in our study is of paramount importance, as it offers a holistic view of the emotional and social dispositions of the participants, and by extension, influences their emotion regulation strategies, self-perception, self-expression, and ultimately, their affiliation with the V or AV groups.

The primary objective of the study was to investigate personality differences between Vs and AVs. Such differences are potentially crucial from both a theoretical and a practical perspective because they allow for an exploration of potential psychological factors underlying the respective stances of these two groups. We specifically aim to identify key traits, motivations, and beliefs that guide respondent attitudes and actions towards vaccination. Collectively, these understandings may inform targeted interventions and communication strategies to promote public health, while also respecting individual perspectives and concerns.

## 2. Method

### 2.1. Participants

Participants were recruited via convenience sampling, using mTurk. They were required to be 18 years of age or older and English-speaking. A >95 % approval percentage and a Human Intelligence Tasks (HITS)

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<sup>1</sup> In this article, the terms “Vaxxers” and “Anti-Vaxxers” are utilized solely as heuristic devices to facilitate understanding and discussion. They are not intended to convey any pejorative connotations, nor do they reflect the authors' personal opinions or biases.

approval >1000 were implemented to prevent bots from completing the measures. Participants were not limited with respect to their location or country of residence. Within two days, we recruited 283 Vaxxers (181 male, 102 female) and 196 Anti-Vaxxers (126 male, 70 female). Vaxxers ranged from 20 to 77 years in age ( $M = 34.9$ ,  $SD = 9.36$ ) and Anti-Vaxxers ranged from 22 to 81 years in age ( $M = 34.6$ ,  $SD = 10.59$ ). Participants were each paid \$1 for completing the instruments.

## 2.2. Measures

The design included the following instruments:

**Short D3 (Jones & Paulhus, 2014):** This 27-item measure assessed the Dark Triad traits (Machiavellianism, Narcissism, and Psychopathy). Participants responded on a 5-point Likert scale. Example items include “It’s not wise to tell your secrets”, “I hate being the center of attention” and “People who mess with me always regret it”.

**HEXACO-60 (Ashton & Lee, 2009):** This 60-item questionnaire evaluated six personality traits: Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness. Participants responded on a 5-point Likert scale. Example items include “I rarely express my opinions in group meetings” and “Having a lot of money is not especially important to me”.

**Trait Emotional Intelligence Questionnaire (TEIQue; Petrides, 2009):** This 153-item measure provides scores on 15 facets, four factors (Well-Being, Self-Control, Emotionality, Sociability), and global trait EI. Facet scores were not analyzed in this study. Participants responded on a 7-point Likert scale. Example items include “Expressing my emotions with words is not a problem for me.” and “I often find it difficult to see things from another person’s viewpoint.”

Additionally, demographic questions were included, addressing age, sex, and place of residence. In total, the study concentrated on 14 distinct variables. All instruments employed in the study have excellent psychometric properties and have been widely used by researchers internationally. The study received ethical approval from Mount. Royal University’s Institutional Review Board.

## 2.3. Procedure

Two different recruitment posters were placed on mTurk. Both posters described the personality and demographic questionnaires that participants would be asked to complete and differed only in that one poster stipulated that participants had to be strongly in favor of being vaccinated against COVID, while the other stipulated that participants had to be strongly opposed to being vaccinated against COVID. Once participants signed up for the study, they were directed to a Qualtrics link. At this point, they were presented with a comprehensive information letter, and upon providing consent, they proceeded to the questionnaires. Participants had a three-hour window to complete the survey and were instructed to input a survey code upon completion.

## 3. Results

Our main objective was to compare Vaxxers and Anti-Vaxxers on the constructs of the study. Additionally, we sought to explore potential sex-related differences, especially considering prior literature indicating a higher prevalence of Dark Triad traits in males (e.g., Baughman et al., 2014).

We first ran a series of 2 (sex)  $\times$  2 (group) ANOVAs, however these did not return any significant main effects for sex nor any significant sex  $\times$  group interactions. Accordingly, we reverted to independent samples  $t$ -tests comparing Vs against AVs. To control for familywise Type I error, we used a Bonferroni-corrected significance level of  $p = 0.05/14 \leq 0.0036$  for each of the 14 comparisons. Means, standard deviations, and  $t$ -test results (including effect sizes) can be found in Table 1.

Vaxxers scored significantly higher than Anti-Vaxxers on HEXACO Honesty/Humility and Conscientiousness, but lower on all five TEIQue

**Table 1**

Descriptive statistics and effect sizes for the study variables.

	Vaxxers		Anti-vaxxers		$t$	Cohen's $d$
	Mean	SD	Mean	SD		
<b>Trait EI</b>						
Well-being	4.95	0.98	5.24	1.05	3.065*	0.29
Self-Control	4.90	1.03	5.24	1.01	3.558*	0.33
Emotionality	4.90	1.01	5.23	1.03	3.413*	0.32
Sociability	4.84	1.04	5.19	1.04	3.653*	0.34
Global trait EI	4.90	1.00	5.23	1.02	3.452*	0.33
<b>Dark Triad</b>						
Machiavellianism	36.32	6.87	38.08	6.23	2.813*	0.27
Narcissism	32.25	5.41	34.14	5.44	3.303*	0.35
Psychopathy	31.28	7.32	33.02	6.47	2.647 ns	–
<b>HEXACO</b>						
Honesty/humility	29.15	4.58	28.13	2.88	2.736*	0.26
Emotionality	31.72	3.85	31.88	2.56	0.499 ns	–
Extraversion	32.07	4.49	32.66	2.91	1.596 ns	–
Agreeableness	31.42	4.20	31.41	2.74	0.019 ns	–
Conscientiousness	30.66	5.48	29.24	3.69	3.128*	0.29
Openness	31.78	4.41	31.16	3.39	1.636 ns	–

Note. \* $p \leq 0.0036$ ; ns = not significant.

variables (global score plus the four trait EI factors) as well as on Machiavellianism and Narcissism from the Dark Triad. They also scored lower than Anti-Vaxxers on psychopathy, but this difference did not reach the Bonferroni-corrected level of significance ( $p = 0.004$ ). There were no significant differences between the groups on HEXACO Emotionality, Extraversion, Agreeableness, or Openness. Also shown in Table 1 are Cohen's  $d$  effect sizes. These were all considered to be in the “upper-low” end, ranging from 0.26 (Honesty/Humility) to 0.35 (Narcissism).

## 4. Discussion

The higher scores of Vaxxers on Honesty/Humility and Conscientiousness align with recent findings on the topic (e.g., Li, 2022). They reflect the inclination of this group to be more aware of and to readily adhere to social norms and expectations, potentially combined with a heightened sense of responsibility towards the community. This greater sense of responsibility would apply to those who believe that vaccination against COVID-19 serves the community's best interests.

Anti-Vaxxers, on the other hand, scored higher on the Dark Triad traits for which there also seems to be some empirical evidence in this rapidly growing literature (e.g., Rudloff et al., 2023). Dark traits may predispose individuals towards mistrust of authority and “post-truth epistemic beliefs”, which encompass a strong faith in one's intuition for facts, a low need for evidence, and the strong conviction that truth is political (Rudloff et al., 2022, 2023). People who trust in authority are also more likely to get vaccinated (Parsons Leigh et al., 2022).

To our knowledge, this is the first study that looked at the relationships between trait EI and vaccination attitudes. Very interestingly, Anti-Vaxxers scored higher on trait EI than Vaxxers. There are at least two key processes in operation here. First, there is a well-established positive relationship between trait EI and Narcissism (e.g., Petrides et al., 2011). This illustrates a fundamental tenet of the underlying theory, viz., that high trait EI scores are not necessarily “good” and “adaptive,” while low trait EI scores are not necessarily “bad” and “maladaptive”. The results here distinctly reflect the multidimensional characteristics of trait EI and the less complex construct of Narcissism, thereby elucidating their intricate roles in adherence to government mandates, including health protective policies (e.g., Hatemi & Fazekas, 2022).

Second, Anti-Vaxxers may be more emotionally resilient as well as more broadly confident in their perceptions – including the emotional

perceptions that trait EI encompasses – as a result of more thoroughly examined (as distinct, however, from accurate) convictions. This strong sense of self-belief bolsters their effort and persistence in upholding their views as per Bandura's general predictions about individuals with high self-confidence beliefs (Bandura, 1997).

Our study has limitations. Notable among these was the substantially larger number of male than female participants, although this is offset somewhat by the absence of sex differences on any of the personality variables we examined. Upon reflection, we also recognize that we did not inquire about participants' histories with other vaccinations (e.g., for influenza), their beliefs in vaccination-related conspiracy theories, or their political inclinations (e.g., liberal or conservative), which could have provided valuable insights. Finally, although we sampled a fairly broad range of personality variables, there are undoubtedly other traits on which Vaxxers and Anti-Vaxxers might be expected to differ (e.g., acquiescence, need for belonging, psychological reactance, and tolerance for ambiguity). All these are issues that might be addressed in future studies in this area.

In conclusion, significant differences of low-to-moderate effects sizes exist between the personality profiles of Vaxxers and Anti-Vaxxers. These differences are important for communication, public health strategies, and policy-making. Furthermore, from a practical perspective, the understanding of these personality differences can feed into tailored messaging, enhanced interventions, and the fostering of social cohesion. Such efforts will ideally contribute to the development of effective policies that strike a balance between individual and societal needs, resulting in improved health outcomes at both levels.

#### CRedit authorship contribution statement

**Annie Ngo:** Methodology, Software, Formal analysis, Investigation, Resources, Data curation, Writing – original draft, Visualization. **K.V. Petrides:** Formal analysis, Writing – review & editing. **Phillip A. Vernon:** Conceptualization, Methodology, Software, Validation, Formal analysis, Data curation, Writing – review & editing, Supervision, Project administration, Funding acquisition.

#### Data availability

Data will be made available on request.

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