


Please cite the Published Version

Papageorgiou, Kostas A, Denovan, Andrew , Dagnall, Neil, Artamonova, Elena, Gianniou, Foteini-Maria, Papageorgiou, Sofia, Plouffe, Rachel A, Kowalski, Christopher Marcin, Saklofske, Donald H, Kyriazos, Theodoros, Stalikas, Anastasios and Costantini, Giulio (2023) Grandiose narcissism indirectly associates with lower psychopathology across five Countries. Journal of Psychiatric Research. ISSN 0022-3956

DOI: <https://doi.org/10.1016/j.jpsychires.2023.10.003>

Publisher: Elsevier

Version: Accepted Version

Downloaded from: <https://e-space.mmu.ac.uk/632732/>

Usage rights:  [Creative Commons: Attribution 4.0](https://creativecommons.org/licenses/by/4.0/)

Additional Information: This is an open access article published in Journal of Psychiatric Research, by Elsevier.

Data Access Statement: Data are available from the first author upon reasonable request.

Enquiries:

If you have questions about this document, contact rsl@mmu.ac.uk. Please include the URL of the record in e-space. If you believe that your, or a third party's rights have been compromised through this document please see our Take Down policy (available from <https://www.mmu.ac.uk/library/using-the-library/policies-and-guidelines>)

Journal Pre-proof

Grandiose narcissism indirectly associates with lower psychopathology across five Countries

Kostas A. Papageorgiou, Andrew Denovan, Neil Dagnall, Elena Artamonova, Foteini-Maria Gianniou, Sofia Papageorgiou, Rachel A. Plouffe, Christopher Marcin Kowalski, Donald H. Saklofske, Theodoros Kyriazos, Anastasios Stalikas, Giulio Costantini

PII: S0022-3956(23)00441-7

DOI: <https://doi.org/10.1016/j.jpsychires.2023.10.003>

Reference: PIAT 5856

To appear in: *Journal of Psychiatric Research*

Received Date: 4 August 2023

Revised Date: 22 September 2023

Accepted Date: 5 October 2023

Please cite this article as: Papageorgiou KA, Denovan A, Dagnall N, Artamonova E, Gianniou F-M, Papageorgiou S, Plouffe RA, Kowalski CM, Saklofske DH, Kyriazos T, Stalikas A, Costantini G, Grandiose narcissism indirectly associates with lower psychopathology across five Countries, *Journal of Psychiatric Research* (2023), doi: <https://doi.org/10.1016/j.jpsychires.2023.10.003>.

This is a PDF file of an article that has undergone enhancements after acceptance, such as the addition of a cover page and metadata, and formatting for readability, but it is not yet the definitive version of record. This version will undergo additional copyediting, typesetting and review before it is published in its final form, but we are providing this version to give early visibility of the article. Please note that, during the production process, errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

© 2023 Published by Elsevier Ltd.



Grandiose Narcissism Indirectly Associates with Lower Psychopathology Across Five Countries

Kostas A. Papageorgiou^{1,2}, Andrew Denovan³, Neil Dagnall³, Elena Artamonova³, Foteini-Maria Gianniou¹, Sofia Papageorgiou^{4,5}, Rachel A. Plouffe⁶, Christopher Marcin Kowalski⁷, Donald H. Saklofske⁷, Theodoros Kyriazos⁸, Anastasios Stalikas⁸, & Giulio Costantini⁹

¹School of Psychology, Queen's University Belfast, Belfast, United Kingdom

²Department of Psychology, Neapolis University Pafos, Pafos, Cyprus

³Department of Psychology, Manchester Metropolitan University, Manchester, United Kingdom

⁴Hellenic Open University

⁵University of Thessaly

⁶School of Humanities, Social Sciences and Law, University of Dundee

⁷Department of Psychology, University of Western Ontario, London, Canada

⁸ Department of Psychology, Panteion University of Social and Political Sciences, Athens, Greece

⁹Department of Psychology, University Milano-Bicocca, Milan, Italy

Author Note

Correspondence concerning this article should be addressed to Dr Kostas A. Papageorgiou, School of Psychology, Queen's University Belfast, 18-30 Malone Road, Belfast, Northern Ireland, United Kingdom, BT9 5BN; K.Papageorgiou@qub.ac.uk

Data Availability Statement

Data are available from the first author upon reasonable request.

Disclosure Statement

The authors have no conflicts of interest to declare.

Grandiose Narcissism Indirectly Associates with Lower Psychopathology Across Five Countries

Journal Pre-proof

Abstract

Using five independent non-clinical cross-cultural samples (*total N* = 3,649; overall *Mage* = 29.31; 31% male and 69% female), this study explored the extent to which Dark Triad traits were indirectly associated with symptoms of psychopathology through mental toughness. Although Machiavellianism and psychopathy have not been studied extensively in this context, previous research (both cross-sectional and longitudinal) reports that grandiose narcissism increases mental toughness contributing indirectly to positive outcomes such as lower anxiety, stress, and depression. Accordingly, this study examined Machiavellianism, psychopathy, and narcissism in the context of mental toughness and psychopathology. A particular focus was placed on investigating negative relationships between grandiose narcissism and psychopathology. Participants completed self-report measures assessing the Dark Triad, mental toughness, and psychopathology. In all samples, grandiose narcissism exerted moderate negative, indirect associations with anxiety, stress, and depression through mental toughness. Relationships between Machiavellianism and psychopathy and psychopathology were generally weak and positive but varied across countries. Findings provided further cross-cultural support for a mediation model in which grandiose narcissism is related to higher mental toughness and lower psychopathology. Outcomes from this study indicate that exploration of the link between grandiose narcissism and resilience traits such as mental toughness can provide important conceptual insights into the adaptive properties of narcissism, and help to explain why grandiose narcissism is associated with a decrease in some psychopathological symptoms.

Keywords: cross-cultural; Dark Triad; mental toughness; narcissism; psychopathology

1. Introduction

The Dark Triad refers to the three interrelated traits including Machiavellianism, narcissism, and psychopathy (Paulhus & Williams, 2002). Christie and Geis (1970) derived their conceptualization of Machiavellianism from the writings of the 16th century political and military strategist and leader Niccolò Machiavelli. Hence, the construct denotes individuals who demonstrate strong agreement with the opinions of Machiavelli, such as endorsement of scheming and the use of manipulation. Machiavellianism is characterized by cynicism, indifference to morality, and distrust of others (Dahling et al., 2009). Subclinical narcissism includes facets retained from the clinical syndrome, namely grandiosity, entitlement, dominance, and superiority. Two main types of narcissism exist: grandiose and vulnerable. Grandiose narcissism encompasses exhibitionism, lack of humility/modesty, and interpersonal dominance, whereas principal features of vulnerable narcissism include negative affect, distrust, selfishness, and a need for attention/recognition (Dickinson & Pincus, 2003). Historically, psychopathy was investigated in clinical and institutional settings. Illustratively, Hare (1980) developed the Psychopathy Checklist (PCL) as a diagnostic tool to screen for clinical levels of psychopathy. In 1985, Hare established the Self-Report Psychopathy (SRP) scale, which facilitated wider assessment of psychopathy in subclinical research.

The Dark Triad was the initial taxonomy proposed to represent dark personalities. The three traits share a dark core composed of diminished empathy, ruthless exploitation of others (Jones & Figueredo, 2013), and a predisposition to high antagonism (Truhan et al., 2021). Noting these commonalities, investigators have often examined Dark Triad collectively. However, other researchers criticize this approach because Machiavellianism, narcissism, and psychopathy differ in important ways, including, for example, their propensities toward impulsivity (Jones & Paulhus, 2011). Studies also report variations within traits as a function of facets (Harms et al., 2022). For instance, accumulating evidence suggests that grandiose and

vulnerable narcissism form two separate factors. This distinction is important because grandiose narcissism does not fit well within the Dark Triad core of callousness and manipulation (Truhan et al., 2021).

Explicitly, grandiose narcissism is mostly associated (directly, indirectly or via its interaction with other traits) with positive outcomes such as lower levels of psychopathology (Papageorgiou et al., 2020; Sedikides et al., 2011), higher income (Luo et al., 2022), more strategic learning in university students (Denovan et al., 2021), higher self-rated creativity (Furnham et al., 2013), higher emotional intelligence (Petrides et al., 2011), and higher mental toughness (Onley et al., 2013).

Acknowledging these points, the present cross-cultural study investigated the direct and indirect associations between the Dark Triad and anxiety, stress, and depression through mental toughness. A focus was placed on grandiose narcissism relative to the other two traits because despite being a dark trait, narcissism has consistently shown a negative indirect association with psychopathology through mental toughness.

1.1 Grandiose narcissism and mental toughness

Mental toughness is an important individual difference factor that facilitates the ability to deal effectively with life challenges and pressures (Lin et al., 2017; Denovan et al., 2022). Although mental toughness was originally studied in sporting domains (Dagnall et al., 2021), the construct's importance is also recognized in a range of other applied settings (Drinkwater et al., 2019; Wheatley et al., 2023). At a conceptual level, mental toughness is an umbrella term that denotes possession of positive psychological resources that aid performance across achievement contexts (Gucciardi et al., 2015a; Perry et al., 2021). Specific features pertinent to the present study include the ability to deal with stressors, utilization of effective coping strategies (e.g., reappraising demanding situations as opportunities for self-development), and the inclination to proactively seek out opportunities for personal growth (St Clair-Thompson

et al., 2015). These attributes are attendant with corresponding values, attitudes, emotions, and thoughts.

To date, several studies have established a moderate positive association between grandiose narcissism and mental toughness (Onley et al., 2013; Papageorgiou et al., 2017, 2018, 2019; Sabouri et al., 2016). Although it is not clear why grandiose narcissism and mental toughness correlate positively, it is possible that this correlation is mainly due to mental toughness' component of confidence in one's abilities that is tapping into grandiose narcissism's self-enhancement properties. Through its positive relationship with mental toughness, grandiose (as opposed to vulnerable) narcissism has been shown to predict various positive outcomes in the context of education and psychopathology. For example, a semi-longitudinal study has shown that at the beginning of the school term, grandiose narcissism increases mental toughness by the end of term, contributing to higher school grades in adolescent students (Papageorgiou et al., 2018).

Through its positive association with mental toughness, grandiose narcissism has been shown to reduce anxiety, depression, and stress in three independent samples (Papageorgiou, Denovan, et al., 2019a; Papageorgiou et al., 2019b). The same studies reported that vulnerable narcissism contributed to higher psychopathology through its negative association with mental toughness. Another study has used mediation analysis to show that grandiose narcissism contributed indirectly to reduced surface learning, increased strategic learning, and lower symptoms of depression in university students (Denovan et al., 2021). A semi-longitudinal, cross-cultural study has also shown that grandiose narcissism exerted a negative indirect effect on anxiety, stress, and depression through mental toughness in two samples from the UK and Greece (Truhan et al., 2022). In this study, grandiose narcissism and mental toughness were assessed just before the start of the COVID-19 pandemic, while psychopathology was assessed before and during the pandemic. Finally, two cross-sectional studies with five independent

Hungarian samples reported that grandiose narcissism was associated with higher mental toughness and resilience and reduced levels of psychopathology (Zhabo, Kun, Balogh, Simon, Csike, 2022).

1.2 The current study

Extant research indicates that individuals who score high on both grandiose narcissism and mental toughness may be highly goal oriented, respond proactively to stressors, and exhibit better mental health outcomes. This is consistent with the notion that including subclinical narcissism (or at least its grandiose facet) into the Dark Triad as a trait that links to poor and toxic psychosocial outcomes, requires revision (e.g., Truhan et al., 2020). This proposition is consistent with a large meta-analysis of the Dark Triad literature that failed to report statistically significant correlations between narcissism and various measures of negative psychosocial outcome, such as antisocial tactics, aggression, sex-related issues and morality problems (with the exception of a weak positive correlation between narcissism and interpersonal difficulties; Muris et al., 2017).

Noting this, additional evidence is needed to examine the relationship between grandiose narcissism and other traits, such as mental toughness, across diverse populations and contexts. This academic work will help to identify and promote narcissism's adaptive tendencies while delimiting its potential for harm. To achieve this, the present study tested and directly compared the results of a mediation model, across five independent cross-cultural samples. It was predicted that grandiose narcissism would associate negatively with symptoms of psychopathology through mental toughness. Commensurate with previous findings, it was further predicted that Machiavellianism and psychopathy would show either no relationship or a positive relationship with psychopathology.

2.0 Method

2.1 Sample

This study used five independent national samples enrolled through advertisements on social networks and word of mouth. Data collection took place online. Preliminary data screening eliminated data points with z-scores > 3.29 or < -3.29 *SDs* (26 UK, 94 Greece, 15 Italy, 58 Russia, and 1 Canada) (Tabachnick & Fidell, 2013). Definitive samples included: United Kingdom (UK), 616 participants (433 females and 183 males; *Mage* = 27.88, *SD* = 11.15, range = 18 - 71); Greece, 1,238 participants (869 females and 378 males; *Mage* = 35.30, *SD* = 13.10, range = 18 to 86); Italy, 428 participants (314 females and 114 males; *Mage* = 27.40, *SD* = 10.65, range = 18 - 69); Russia, 1,100 participants (746 females and 354 males; *Mage* = 37.23, *SD* = 10.54, range = 18 - 72); and Canada (267 participants, 142 females and 125 males; *Mage* = 18.84, *SD* = 1.82, range = 18 - 35).

2.2 Instrument translation

For instrument translation we followed the method suggested by Brislin (1986) and Beaton et al. (2000). Specifically, to enable data collection in Greece, Russia, and Italy, two native speaking external colleagues (i.e., not co-authors) completed forward translation of the Mental Toughness Questionnaire (MTQ10), and the Short Dark Triad questionnaire (SD3; Jones & Paulhus, 2014) (for Greece only). Then, a co-author and an external colleague (an English teacher whose first language is Greek) proficient in English, whose respective native languages are Greek and Russian, evaluated unsatisfactory expressions/idioms and completed back translation. The same approach was followed for the Italian translation of the MTQ10. Back translation is an established technique that has been utilized in cross-cultural survey research throughout the past 50 years (Son, 2018; Denovan et al., 2021, 2022).

2.3 Measures

The Short Dark Triad questionnaire (SD3; Jones & Paulhus, 2014) is a widely used measure of subclinical narcissism, subclinical psychopathy, and Machiavellianism (Vaughan et al., 2019). The SD3 includes 27 items with nine per subscale. Responses are given on a 5-

point Likert scale (1 = strongly disagree, to 5 = strongly agree). Example items include 'People see me as a natural leader' and 'Payback needs to be quick and nasty'. Satisfactory validity and internal consistency exist (Jones & Paulhus, 2014).

The measure has been adapted to Russian with good reliability results ($\alpha > .70$ for all scales; Egorova et al., 2015). In this study, Machiavellianism demonstrated acceptable reliability (UK $\alpha = .70$, Greece $\alpha = .70$, Italy $\alpha = .80$, Russia $\alpha = .70$, Canada $\alpha = .84$), as did psychopathy (UK $\alpha = .73$, Greece $\alpha = .74$, Italy $\alpha = .75$, Russia $\alpha = .71$, Canada $\alpha = .75$). Narcissism exhibited a lower reliability estimate for Greece (UK $\alpha = .73$, Greece $\alpha = .61$, Italy $\alpha = .72$, Russia $\alpha = .69$, Canada $\alpha = .67$). However, this subscale tends to exhibit lower reliability (Jones & Paulhus, 2014).

The 10-item MTQ10 (Dagnall et al., 2018; Papageorgiou et al., 2018) is a condensed edition of the MTQ48 (Clough et al., 2002). It includes the highest line-adding items in each of the four facets (i.e., challenge, commitment, control, and confidence). Items are presented as statements (e.g., 'I generally feel in control') and rated on a 5-point Likert scale. Satisfactory reliability exists for the measure (Papageorgiou et al., 2018). Acceptable internal consistency existed in this study (UK $\alpha = .84$, Greece $\alpha = .80$, Italy $\alpha = .79$, Russia $\alpha = .74$, Canada $\alpha = .81$). Unlike the MTQ48 that assesses total MT and its four facets, the MTQ10 provides an overall MT score only.

The 21-item Depression, Anxiety and Stress Scale (DASS-21; Lovibond & Lovibond, 1995) assessed symptoms of depression, anxiety, and stress. The DASS-21 includes three 7-item subscales (one each for depression, anxiety, and stress) with a 4-point Likert response format ranging from 0 (Did not apply to me at all) to 3 (Applied to me very much or most of the time). Items are presented as statements (e.g., 'I found it difficult to relax' and 'I felt that life was meaningless'). The measure possesses good reliability (Moya et al., 2022) and evidenced satisfactory internal consistency in this study (depression: UK $\alpha = .92$, Greece $\alpha =$

.89, Italy $\alpha = .89$, Russia $\alpha = .85$, Canada $\alpha = .90$; anxiety: UK $\alpha = .86$, Greece $\alpha = .85$, Italy $\alpha = .86$, Russia $\alpha = .87$, Canada $\alpha = .84$; stress: UK $\alpha = .84$, Greece $\alpha = .85$, Italy $\alpha = .89$, Russia $\alpha = .90$, Canada $\alpha = .87$).

2.4 Procedure and Ethics

Following advertisements on social networks, interested respondents obtained details of the study's aims and objectives via an information sheet. Participants supplied informed consent to take part and received a message containing a link to the online questionnaire alongside a unique respondent code. Completion of the measures was self-paced, and participants only advanced to the subsequent page after completing all items. Upon conclusion of the study, participants were debriefed. The project received ethical approval from the lead university. Procedures performed were in accordance with the ethical standards of the institutional and/or national research committee and concurred with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

2.5 Data analysis

Assessment of bivariate correlations investigated basic associations among variables. Analysis (using Mplus 7.4; Muthén & Muthén, 2015) included an assessment of a mediation model with the total sample to investigate the hypothesized indirect/mediating role of mental toughness in relation to Dark Triad traits, symptoms of depression, anxiety, and stress. The hypothesized model included direct paths from Dark Triad traits to mental toughness, and from mental toughness to depression, anxiety, and stress, whilst integrating the paths from Dark Triad traits to depression, anxiety, and stress. This method was valuable to examine if the associations of the Dark Triad traits with depression, anxiety, and stress take place in the absence of any intervening variable, or if these are channeled through mental toughness (Tighezza, 2013). Model testing included bootstrapping (1000 resamples) to assess the

significance of the indirect relationships relative to 95% bias-corrected confidence intervals (Preacher & Hayes, 2008).

The chi-square statistic, Comparative Fit Index (CFI), Root-Mean-Square Error of Approximation (RMSEA) and Standardized Root-Mean-Square Residual (SRMR) were used to assess model fit. An acceptable model required $CFI > .90$, $SRMR < .08$, and $RMSEA < .08$ (Browne & Cudeck 1993). For RMSEA the 90% confidence interval (CI) was incorporated. Comparison of models included a Satorra-Bentler chi-square difference test (Bang et al., 2018).

Lastly, a multigroup path analysis tested cross-cultural invariance by comparing two models. Explicitly, a baseline/unconstrained model with no equality constraints (i.e., equal model structure, but freely estimated coefficients) and a constrained model where all parameters were fixed to be equal between the five countries. A significant chi-square during model comparison infers non-invariance in relation to the structural paths (Bang et al., 2018). Effect sizes were interpreted using Kenny's (2016) criteria of small $\leq .01$, medium $\leq .09$, and large $\geq .25$.

3.0 Results

3.1 Preliminary analysis

Preliminary assessment of univariate normality revealed that skewness values fell between -2.0 and +2.0, and kurtosis between -4.0 and +4.0 (Field & Miles, 2010) (Table 1). Bivariate correlations (Table 1) indicated small-to-moderate significant associations between the Dark Triad traits. Mental toughness evidenced weak associations with Machiavellianism and psychopathy, and a moderate relationship with narcissism. Depression, anxiety, and stress correlated negatively with narcissism and mental toughness, and positively with Machiavellianism and psychopathy.

TABLE 1 HERE

3.2 Model test for total sample

The mediation model with the total sample was a saturated model, containing as many parameters as data points (Kline, 2005). This is not informative insofar as model fit indices. Accordingly, non-significant paths were trimmed from the model to increase interpretability. The only non-significant path was from narcissism to depression, $\beta = -.03$, $p = .028$. A model without this path revealed good fit, $\chi^2 (1, N = 3649) = 2.56$, $p = .109$, CFI = 1.0, RMSEA = .02 (90% CI of .01 to .05), SRMR = .01. In addition, this model did not suggest a significantly worse fit than the original model, S-B $\chi^2 (1) = 2.56$, $p = .109$. This model was retained for subsequent analyses. Figure 1 displays standardized regression coefficients of this model, which accounted for 33%, 25%, and 28% of the variance in depression, anxiety, and stress respectively.

FIGURE 1 HERE

Assessment of indirect effects using the bootstrap procedure (Table 2) indicated that mental toughness significantly mediated the association between all Dark Triad variables (Machiavellianism, narcissism, psychopathy) and depression, anxiety, and stress. Specifically, mental toughness appeared to contribute to the Dark Triad variables exerting a weaker association with depression, anxiety, and stress.

TABLE 2 HERE

3.3 Multigroup path analysis

The unconstrained model fit the data well, $\chi^2 (5, N = 3649) = 2.30$, $p = .807$, CFI = 1.0, RMSEA = .01 (90% CI of .01 to .03), SRMR = .01. The constrained model also demonstrated good fit, $\chi^2 (61, N = 3649) = 146.88$, $p < .001$, CFI = 1.0, RMSEA = .04 (90% CI of .04 to .05), SRMR = .05. However, a significant difference existed in terms of fit, S-B $\chi^2 (56) = 144.30$, $p < .001$. This suggested that relationships among Dark Triad traits, mental toughness, depression, anxiety, and stress varied by country. Accordingly, paths were fixed sequentially

to reveal which were moderated by country (Table 3). Findings suggested that the paths varied from Machiavellianism to mental toughness, narcissism to mental toughness, mental toughness to depression, mental toughness to anxiety, mental toughness to stress, Machiavellianism to depression, anxiety, and stress, and psychopathy to anxiety. Subsequently, a partially constrained model was computed, in which the paths that differed by country were allowed to vary. Good fit existed, $\chi^2 (29, N = 3649) = 39.02, p = .056, CFI = 1.0, RMSEA = .02$ (90% CI of .01 to .04), SRMR = .02.

In comparison with the unconstrained model, a non-significant difference existed, $S-B\chi^2 (24) = 35.88, p = .056$. A significant difference was apparent with the fully constrained model, $S-B\chi^2 (32) = 119.02, p < .001$. These outcomes suggested that some of the paths were moderated by country, and it was necessary to retain the partially constrained model.

Lastly, the authors tested whether country moderated the indirect effects. Results (Table 2) inferred that narcissism consistently exhibited a significant indirect association with depression, anxiety, and stress via mental toughness (with effect sizes ranging from moderate to large). The most notable differences occurred for Machiavellianism, with significant indirect effects existing for UK, Greece, and Italian samples, but not for the Russian and Canadian samples. Comparison of indirect effects (Table 4) indicated that paths relating to Machiavellianism were moderated by country, which is unsurprising given the discrepancies reported above. Differences among indirect effects for narcissism (in relation to depression and anxiety only) reflect the variance between large and medium effect sizes (i.e., greater effect sizes for UK, Italy, Canada, lower for Greece and Russia).

4.0 Discussion

Previous research has found that grandiose narcissism associates negatively with symptoms of psychopathology indirectly through increasing resilience (e.g., Papageorgiou et al., 2019). Five samples from distinct cultural backgrounds were analyzed to explore cross-

culturally the association of grandiose narcissism as well as psychopathy and Machiavellianism with resilience (mental toughness) and psychopathology (stress, anxiety, and depression).

Of the dark traits, grandiose narcissism revealed the most consistent pattern of results. Firstly, grandiose narcissism exhibited significant and negative associations with stress, anxiety, and depression through mental toughness across the five samples. The tested model explained a small-to-moderate (depending on the country and type of psychopathology) amount of variation in psychopathology scores that ranged from approximately 2% to 10%. Secondly, the model demonstrated slightly stronger relationships among grandiose narcissism, mental toughness, and depression (compared to either anxiety or stress). Conceptually, grandiose narcissism can be perceived as the opposite of depression. In this context, individuals scoring high on grandiose narcissism have unrealistic and self-enhancing views about themselves. Individuals scoring high on symptoms of depression also have an unrealistic view about themselves, such that they self-devalue. As such, grandiose narcissism may be particularly adaptive with regards to depression because it primarily encapsulates traits of self-belief. This is in line with the results of a recent meta-analysis, which reported that self-enhancement was positively associated with psychological adjustment across sex, age, cohort, and culture (Dufner et al., 2019).

Thirdly, the model explained the highest amount of variation (on average) in psychopathology in the UK, followed by Canada and Italy. Interestingly, the model revealed almost identical results for the Greek and Russian samples. Looking at differences among the samples, the Greek and Russian samples were of similar age and had the highest mean age as compared to the other three samples. It could be that with increasing age, the dark traits lose some of their significance (positive or negative) for important life outcomes. The possible decrease in malevolent traits with age aligns with the maturity principle; that is, personality may change in a way to be more socially mature (i.e., emotionally stable, agreeable, and

conscientious), communal, responsible, and self-controlled (Luo et al., 2022; Roberts et al., 2008).

Machiavellianism and psychopathy displayed weaker (as compared to grandiose narcissism) and positive (as opposed to negative) relationships with psychopathology through mental toughness. These results were similar in terms of direction and effect size with the exception of Machiavellianism in the Russian and Canadian samples (where the indirect effects were not significant). The similar results for psychopathy and Machiavellianism could be linked to the way these two traits are typically assessed. Specifically, previous research contends that psychopathy and Machiavellianism scales measure the same concept, and that Machiavellianism assessment tools fail to capture the construct as articulated in theoretical descriptions (Miller et al., 2017).

This investigation should be viewed in light of some important limitations. Firstly, the current study cannot fully explain the cross-cultural differences discussed above. However, the results highlight the need for further cross-cultural research investigating the ways in which the Dark Triad is expressed and associated with mental health. The study is cross-sectional, which precludes definitive conclusions concerning the causal order of the variables. However previous semi-longitudinal work supports the notion that mental toughness mediates the effect of grandiose narcissism on psychopathology (Denovan, et al., 2021). Despite evidence suggesting the Dark Triad is multifaceted (Truhan et al., 2022), the present study has explored dark traits as unidimensional constructs. This is problematic, especially in the context of cross-cultural research. For example, while a recent cross-cultural study failed to report significant differences in narcissism assessed with the SD3 in two samples from the UK and Russia (Papageorgiou et al., 2022), it reported a significant, theoretically relevant difference between the two countries on the narcissism Antagonism facet using the Five-Factor Narcissism Inventory Short Form (Sherman et al., 2015). Incorporating in cross-cultural research other (to

grandiose) facets of narcissism—such as its antagonistic and vulnerable facets—will help to provide a more balanced account of the positive and negative correlates of narcissism.

While large samples from five distinct cultural backgrounds were collated, other variables (e.g., differences in socioeconomic conditions among the countries) that could explain cross-cultural differences in the tested model have not been assessed. Future research should investigate ways through which narcissism may differentially impact resilience (e.g., through narcissism and MT's possible association with sleep patterns, see Sabouri et al., 2016) and mental health in different cultural and socioeconomic environments. Another limitation refers to the demographic differences among the cross-cultural samples. Specifically, some of the differences in the main study variables among different countries could be influenced by the age differences among the samples. As such, direct cross-cultural comparisons and their interpretation become difficult as these may be confounded by demographic differences in the samples. Finally, self-report data may be influenced by common-method variance (Podsakoff et al., 2003) and social desirability. In the present study reliance on self-report measures may be problematic. Specifically, it could be that individuals high in grandiose narcissism may not objectively possess greater mental toughness and lower levels of psychopathology; rather, their perception of mental toughness could be inflated due to overconfidence. As such, while self-report methods hold value, it is important to acknowledge the possibility that self-perceptions might not align with objective reality. Narcissistic individuals may believe themselves to be more resilient, but this should be approached cautiously and should be investigated further. Despite the common criticism of the self-report method, two points should be made here: (1) It appears that the self-report method remains the workhorse of personality research with few alternatives (Papageorgiou et al., 2023); (2) Research suggests that most of the hypothesized trait-outcome associations in personality research can be successfully replicated (Soto, 2019).

5.0 Conclusion

The present investigation has direct theoretical and indirect applied implications. The findings build on existing evidence regarding the positive association between grandiose narcissism and psychopathology, primarily depression, through increasing resilience. Although several recent papers have reported this finding, the aetiology of this association remains unexplored. Indeed, it is fascinating that grandiose narcissism correlates positively with Machiavellianism and psychopathy, as well as with higher resilience and lower levels of common psychopathology with these findings replicating consistently across cultures. Cross-cultural research has the potential to effectively uncover adaptive and maladaptive aspects of the Dark Triad. For example, previous work has shown that the Dark Triad is sensitive to socioeconomic conditions (Yu et al., 2022). As such, future work may explore whether grandiose narcissism is particularly adaptive in relation to psychopathology in the presence of extreme adversity, and whether these adaptive properties come at a cost (e.g., peer problems due to negative stereotypes about narcissism). Considering the malleability of personality traits, joint intervention programmes with general populations could promote the adaptive—rather than maladaptive—aspects of narcissism to reduce levels of psychopathology.

Author contributions

K.P. designed the study and wrote the introduction and discussion. A.D., wrote the method, conducted the analyses and wrote the results. K.P. and F.M.G., collected the data in the UK. A.D., N.D., and E.A. collected the data in Russia. R.A.P, C.M.K., and D.H.S., collected the data in Canada. S.P., T.K., and A.S. collected the data in Greece. G.C. collected the data in Italy. All authors provided critical comments in the write-up and analyses phases of the manuscript. All authors reviewed the manuscript.

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

We are grateful to the study participants for their contribution to this research.

Funding

The entire study was conducted with no external funding.

Data Availability Statement

Data are available from the first author upon reasonable request.

Disclosure Statement

The authors have no conflicts of interest to declare.

References

- Aune, T., & Stiles, T. C. (2009). The effects of depression and stressful life events on the development and maintenance of syndromal social anxiety: Sex and age differences. *Journal of Clinical Child & Adolescent Psychology*, 38(4), 501–512. <https://doi.org/10.1080/15374410902976304>
- Bang, H., Bravo, G. A., Mello Figuerôa, K., & Mezzadri, F. M. (2019). The impact of volunteer experience at sport mega-events on intention to continue volunteering: Multigroup path analysis. *Journal of community psychology*, 47(4), 727–742. <https://doi.org/10.1002/jcop.22149>
- Beaton, D.E., Bombardier, C., Guillemin, F., Ferraz, M.B., 2000. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine (Phila Pa 1976)* 25(24), 3186-3191.
- Becht, A. I., Luyckx, K., Nelemans, S. A., Goossens, L., Branje, S. J., Vollebergh, W. A., & Meeus, W. H. (2019). Linking identity and depressive symptoms across adolescence: A multisample longitudinal study testing within-person effects. *Developmental Psychology*, 55(8), 1733–1742. <https://doi.org/10.1037/dev0000742>
- Brislin, R., W., 1986. The wording and translation of research instrument., in: Lonner, W.J.,
- Browne, M.W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In: K. A. Bollen & J.S. Long (Eds.), *Testing structural equation models* (pp.136–162). Sage.
- Christie, R., Geis, F. L., Festinger, L., & Schachter, S. (2014). *Studies in Machiavellianism*. Elsevier Science.
- Clough, P., Earle, K., & Sewell, D. (2002). Mental toughness: The concept and its measurement. In I. Cockerill (Ed.), *Solutions in Sport Psychology* (pp. 32–43). Thomson.

- Dagnall, N., Denovan, A., Papageorgiou, K. A., Clough, P. J., Parker, A., & Drinkwater, K. G. (2019). Psychometric assessment of shortened Mental Toughness Questionnaires (MTQ): factor structure of the MTQ-18 and the MTQ-10. *Frontiers in Psychology*, 10, 1933. <https://doi.org/10.3389/fpsyg.2019.01933>
- Dagnall, N., Drinkwater, K. G., Denovan, A., & Walsh, R. S. (2021). The potential benefits of non-skills training (mental toughness) for elite athletes: Coping with the negative psychological effects of the COVID-19 pandemic. *Frontiers in Sports and Active Living*, 3, 581431. <https://doi.org/10.3389/fspor.2021.581431>
- Dahling, J. J., Whitaker, B. G., & Levy, P. E. (2008). The Development and Validation of a New Machiavellianism Scale. *Journal of Management*, 35(2), 219–257. <https://doi.org/10.1177/0149206308318618>
- Denovan, A., Dagnall, N., Artamonova, E., & Papageorgiou, K. A. (2021). Dark Triad traits, learning styles, and symptoms of depression: Assessing the contribution of mental toughness longitudinally. *Learning and Individual Differences*, 91, 102053. <https://doi.org/10.1016/j.lindif.2021.102053>
- Denovan, A., Dagnall, N., Hill-Artamonova, E., & Musienko, T. (2021). Mental toughness questionnaire (MTQ18): A Russian version. *National Security and Strategic Planning*, (3), 47–59. <https://doi.org/10.37468/2307-1400-2021-3-47-59>
- Denovan, A., Dagnall, N., & Drinkwater, K. (2022). Examining what Mental Toughness, Ego Resiliency, Self-efficacy, and Grit measure: An exploratory structural equation modelling bifactor approach. *Current Psychology*, 1–16. <https://doi.org/10.1007/s12144-022-03314-5>
- Denovan, A., Drinkwater, K. G., Dagnall, N., Artamonova, E., & Musienko, T. (2022). Confirmatory factor analysis and Rasch analysis of the Russian version of the Ego

- Resiliency Scale Revised. *National Security and Strategic Planning*, 37(1), 82–96.
<https://doi.org/10.37468/2307-1400-2022-1-82-96>
- Dickinson, K. A., & Pincus, A. L. (2003). Interpersonal analysis of grandiose and vulnerable narcissism. *Journal of Personality Disorders*, 17(3), 188–207.
<https://doi.org/10.1521/pedi.17.3.188.22146>
- Drinkwater, K., Dagnall, N., Denovan, A., & Parker, A. (2019). The moderating effect of mental toughness: perception of risk and belief in the paranormal. *Psychological Reports*, 122(1), 268–287. <https://doi.org/10.1177/0033294118756600>
- Dufner, M., Gebauer, J. E., Sedikides, C., & Denissen, J. J. (2019). Self-enhancement and psychological adjustment: A meta-analytic review. *Personality and Social Psychology Review*, 23(1), 48–72. <https://doi.org/10.1177/1088868318756467>
- Egorova, M.S., Sitnikova, M.A., & Parshikova, O.V. (2015). Adaptation of the Short Triad Questionnaire. *Psychological Research: Electronic Scientific Journal*, 8(43), 1–1.
- Enders, C. K. (2010). *Applied missing data analysis*. Guilford Press.
- Field, A., & Miles, J. (2010). *Discovering statistics using SAS*. Sage.
- Furnham, A., Hughes, D. J., & Marshall, E. (2013). Creativity, OCD, narcissism and the Big Five. *Thinking Skills and Creativity*, 10, 91–98. <https://doi.org/10.1016/j.tsc.2013.05.003>
- Goldberg, J. H., Breckenridge, J. N., & Sheikh, J. I. (2003). Age differences in symptoms of depression and anxiety: Examining behavioral medicine outpatients. *Journal of Behavioral Medicine*, 26(2), 119–132. <https://doi.org/10.1023/A:1023030605390>
- Gucciardi, D. F., Hanton, S., Gordon, S., Mallett, C. J., & Temby, P. (2015). The concept of mental toughness: Tests of dimensionality, nomological network, and traitness. *Journal of Personality*, 83(1), 26–44. <https://doi.org/10.1111/jopy.12079>

- Hare, R. D. (1980). A research scale for the assessment of psychopathy in criminal populations. *Personality and Individual Differences, 1*(2), 111–119. [https://doi.org/10.1016/0191-8869\(80\)90028-8](https://doi.org/10.1016/0191-8869(80)90028-8)
- Harman, H. H. (1960). *Modern Factor Analysis*. University of Chicago Press.
- Harms, P. D. (2022). Bad is stronger than good. *Zeitschrift Für Psychologie*. <https://doi.org/10.1027/2151-2604/a000496>
- Jonason, P. K., Li, N. P., Webster, G. D., & Schmitt, D. P. (2009). The dark triad: Facilitating a short-term mating strategy in men. *European Journal of Personality, 23*(1), 5–18. <https://doi.org/10.1002/per.698>
- Jones, D. N., & Paulhus, D. L. (2011). The role of impulsivity in the Dark Triad of personality. *Personality and Individual Differences, 51*(5), 679–682.
- Jones, D.N., & Paulhus, D.L. (2014). Introducing the Short Dark Triad (SD3): A Brief Measure of Dark Personality Traits. *Assessment, 21*(1), 28–41. <https://doi.org/10.1177/1073191113514105>
- Jones, D. N., & Figueredo, A. J. (2013). The core of darkness: Uncovering the heart of the Dark Triad. *European Journal of Personality, 27*(6), 521–531. <https://doi.org/10.1002/per.1893>
- Kawamoto, T., Shimotsukasa, T., & Oshio, A. (2020). Cross-sectional age differences in the Dark Triad traits in two Japanese samples. *Psychology and Aging, 35*(1), 91–96. <https://doi.org/10.1037/pag0000399>
- Kenny, D. A. (2016). *Mediation*. <http://davidakenny.net/cm/mediate.htm>
- Lin, Y., Mutz, J., Clough, P. J., & Papageorgiou, K. A. (2017). Mental toughness and individual differences in learning, educational and work performance, psychological well-being, and personality: A systematic review. *Frontiers in Psychology, 8*, 1345. <https://doi.org/10.3389/fpsyg.2017.01345>

- Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the Depression, Anxiety and Stress Scales* (2nd ed.). Psychology Foundation. <https://doi.org/10.1037/t01004-000>
- Luo, Y. L., Kovas, Y., Wang, L., Stalikas, A., Kyriazos, T. A., Gianniou, F. M., ... & Papageorgiou, K. A. (2022). Sex differences in the Dark Triad are sensitive to socioeconomic conditions: the adaptive value of narcissism in the UK, Greece, and China. *Current Psychology*, 1–13. <https://doi.org/10.1007/s12144-022-03302-9>
- Miller, J. D., Hyatt, C. S., Maples-Keller, J. L., Carter, N. T., & Lynam, D. R. (2017). Psychopathy and Machiavellianism: A distinction without a difference? *Journal of Personality*, 85(4), 439–453. <https://doi.org/10.1111/jopy.12251>
- Moya, E., Larson, L. M., Stewart, R. C., Fisher, J., Mwangi, M. N., & Phiri, K. S. (2022). Reliability and validity of depression anxiety stress scale (DASS)-21 in screening for common mental disorders among postpartum women in Malawi. *BMC Psychiatry*, 22(1), 1–11. <https://doi.org/10.1186/s12888-022-03994-0>
- Muthén, L. K., & Muthén, B. O. (2015). *Mplus User's Guide* (7th ed.). Muthén & Muthén.
- Muris, P., Merckelbach, H., Otgaar, H., & Meijer, E. (2017). The malevolent side of human nature: A meta-analysis and critical review of the literature on the dark triad (narcissism, Machiavellianism, and psychopathy). *Perspectives on Psychological Science*, 12(2), 183–204. <https://doi.org/10.1177/1745691616666070>
- Nicholls, A. R., Polman, R. C. J., Levy, A. R., & Backhouse, S. H. (2009). Mental Toughness in Sport: Achievement Level, Gender, Age, Experience, and Sport Type Differences. *Personality and Individual Differences*, 47(1), 73–75. <https://doi.org/10.1016/j.paid.2009.02.006>
- Onley, M., Veselka, L., Schermer, J. A., & Vernon, P. A. (2013). Survival of the scheming: a genetically informed link between the dark triad and mental toughness. *Twin Research and Human Genetics*, 16(6), 1087–1095. <https://doi.org/10.1017/thg.2013.66>

- Papageorgiou, K. A., Truhan, T. E., Cooper, C., Rogoza, R., & Schermer, J. A. (2023). Non-self-report measures to assess personality. *Acta Psychologica*, 103954-103954.
- Papageorgiou, K. A., Denovan, A., Dagnall, N., & Artamonova, E. (2022). A cross-cultural investigation of the Five-Factor Narcissism Inventory short form: Narcissism as a multidimensional trait in the United Kingdom and Russia. *Journal of Personality Assessment*, 104(3), 359–367. <https://doi.org/10.1080/00223891.2021.1929263>
- Papageorgiou, K. A., Likhanov, M., Costantini, G., Tsigeman, E., Zaleshin, M., Budakova, A., & Kovas, Y. (2020). Personality, Behavioral strengths and difficulties and performance of adolescents with high achievements in science, literature, art and sports. *Personality and Individual Differences*, 160, 109917. <https://doi.org/10.1016/j.paid.2020.109917>
- Papageorgiou, K. A., Benini, E., Bilello, D., Gianniou, F. M., Clough, P. J., & Costantini, G. (2019). Bridging the gap: A network approach to Dark Triad, Mental Toughness, the Big Five, and perceived stress. *Journal of Personality*, 87(6), 1250–1263. <https://doi.org/10.1111/jopy.12472>
- Papageorgiou, K. A., Denovan, A., & Dagnall, N. (2019). The positive effect of narcissism on depressive symptoms through mental toughness: Narcissism may be a dark trait but it does help with seeing the world less grey. *European Psychiatry*, 55, 74–79. <https://doi.org/10.1016/j.eurpsy.2018.10.002>
- Papageorgiou, K. A., Gianniou, F. M., Wilson, P., Moneta, G. B., Bilello, D., & Clough, P. J. (2019). The bright side of dark: Exploring the positive effect of narcissism on perceived stress through mental toughness. *Personality and Individual Differences*, 139, 116–124. <https://doi.org/10.1016/j.paid.2018.11.004>
- Papageorgiou, K. A., Mutz, J., Lin, Y., & Clough, P. J. (2018). Mental toughness: A personality trait that is relevant across achievement contexts and mental health outcomes. *The SAGE*

- handbook of personality and individual differences: Applications of Personality and Individual Differences*, 588–604. <https://doi.org/10.4135/9781526451248.n26>
- Papageorgiou, K.A., Malanchini, M., Denovan, A., Clough, P. J., Shakeshaft, N., Schofield, K., & Kovas, Y. (2018). Longitudinal associations between narcissism, mental toughness and school achievement. *Personality and Individual Differences*, 131(1), 105–110. <https://doi.org/10.1016/j.paid.2018.04.024>
- Papageorgiou, K. A., Wong, B., & Clough, P. J. (2017). Beyond good and evil: Exploring the mediating role of mental toughness on the Dark Triad of personality traits. *Personality and Individual Differences*, 119, 19–23. <https://doi.org/10.1016/j.paid.2017.06.031>
- Paulhus, D. L., & Williams, K. M. (2002). The Dark Triad of personality: Narcissism, Machiavellianism, and psychopathy. *Journal of Research in Personality*, 36(6), 556–563. [https://doi.org/10.1016/s0092-6566\(02\)00505-6](https://doi.org/10.1016/s0092-6566(02)00505-6)
- Perry, J. L., Strycharczyk, D., Dagnall, N., Denovan, A., Papageorgiou, K. A., & Clough, P. J. (2021). Dimensionality of the mental toughness questionnaire (MTQ48). *Frontiers in Psychology*, 12, 654836. <https://doi.org/10.3389/fpsyg.2021.654836>
- Petrides, K. V., Vernon, P. A., Schermer, J. A., & Veselka, L. (2011). Trait emotional intelligence and the dark triad traits of personality. *Twin Research and Human Genetics*, 14(1), 35–41. <https://doi.org/10.1375/twin.14.1.35>
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *The Journal of Applied Psychology*, 88(5), 879–903. <https://doi.org/10.1037/0021-9010.88.5.879>
- Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of Management*, 12(4), 531–544. <https://doi.org/10.1177/014920638601200408>

- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*(3), 879–891. <https://doi.org/10.3758/BRM.40.3.879>
- Roberts, B. W., Wood, D., & Caspi, A. (2008). The development of personality traits in adulthood. In O. P. John (Ed.), *Handbook of personality: Theory and research* (3rd ed., pp. 375–398). New York, NY: Guilford Press
- Sabouri, S., Gerber, M., Lemola, S., Becker, S.P., Shamsi, M., Shakouri, Z., Sadeghi Bahmani, D., Kalak, N., Holsboer-Trachsler, E., Brand, S., 2016. Examining Dark Triad traits in relation to sleep disturbances, anxiety sensitivity and intolerance of uncertainty in young adults. *Compr Psychiatry 68*, 103-110.
- Sabouri, S., Gerber, M., Sadeghi Bahmani, D., Lemola, S., Clough, P. J., Kalak, N., ... & Brand, S. (2016). Examining Dark Triad traits in relation to mental toughness and physical activity in young adults. *Neuropsychiatric Disease and Treatment, 229–235*. <https://doi.org/10.2147/NDT.S97267>
- Sedikides, C., Cisek, S., & Hart, C. M. (2011). Narcissism and brand name consumerism. The handbook of narcissism and narcissistic personality disorder: *Theoretical Approaches, Empirical Findings, and Treatments*, 382–392. <https://doi.org/10.1002/9781118093108.ch34>
- Sherman, E. D., Miller, J. D., Few, L. R., Campbell, W. K., Widiger, T. A., Crego, C., & Lynam, D. R. (2015). Development of a short form of the Five-Factor Narcissism Inventory: The FFNI-SF. *Psychological Assessment, 27*(3), 1110–1116. <https://doi.org/10.1037/pas0000100>
- Son, J. (2018). Back translation as a documentation tool. *Translation & Interpreting, 10*(2), 89–100. <https://doi.org/10.12807/ti.110202.2018.a07>

- Soto, C. J. (2019). How replicable are links between personality traits and consequential life outcomes? The life outcomes of personality replication project. *Psychological Science*, *30*(5), 711–727. <https://doi.org/10.1177/0956797619831612>
- St Clair-Thompson, H., Bugler, M., Robinson, J., Clough, P., McGeown, S. P., & Perry, J. (2015). Mental toughness in education: Exploring relationships with attainment, attendance, behaviour and peer relationships. *Educational Psychology*, *35*(7), 886–907. <https://doi.org/10.1080/01443410.2014.895294>
- Szabó, Z. P., Kun, Á., Balogh, B. E., Simon, E., & Csike, T. (2022). Dark and Strong?! The associations between dark personality traits, mental toughness and resilience in Hungarian student, employee, leader, and military samples. *Personality and Individual Differences*, *186*, 111339. <https://doi.org/10.1016/j.paid.2021.111339>
- Tighezza, M. H. (2014). Modeling relationships among learning, attitude, self-perception, and science achievement for grade 8 Saudi students. *International Journal of Science and Mathematics Education*, *12*(4), 721–740. <https://doi.org/10.1007/s10763-013-9426-8>
- Truhan, T. E., Gianniou, F. M., & Papageorgiou, K. A. (2022). Differences in psychiatric symptoms between the UK and Greece prior to and during COVID-19: The roles of subclinical narcissism and mental toughness. *Personality and Individual Differences*, *185*, 111308. <https://doi.org/10.1016/j.paid.2021.111308>
- Truhan, T. E., Wilson, P., Möttus, R., & Papageorgiou, K. A. (2021). The many faces of dark personalities: An examination of the Dark Triad structure using psychometric network analysis. *Personality and Individual Differences*, *171*, 110502. <https://doi.org/10.1016/j.paid.2020.110502>
- Vaughan, R., Madigan, D. J., Carter, G. L., & Nicholls, A. R. (2019). The Dark Triad in male and female athletes and non-athletes: Group differences and psychometric properties of

the Short Dark Triad (SD3). *Psychology of Sport and Exercise*, 43, 64–72.

<https://doi.org/10.1016/j.psychsport.2019.01.002>

Wheatley, C., Batey, M., Denovan, A., & Dagnall, N. (2023). Mental toughness in the Football Association Women's Super League: Relationships with playing experience, perceptions of club infrastructure, support mechanisms and self-esteem. *PLoS One*, 18(5), e0285594.

<https://doi.org/10.1371/journal.pone.0285594>

Journal Pre-proof

Table 1. Means, standard deviations and correlations for all study variables for the total sample and country-specific samples

Variable	<i>M</i>	<i>SD</i>	Skew	Kurt.	1	2	3	4	5	6	7
Total sample											
1. Machiavellianism	27.91	5.56	.01	.03		.28**	.47**	-.02	.16**	.18**	.16**
2. Narcissism	25.43	4.96	.02	.35			.32**	.33**	-.14**	-.04*	-.04*
3. Psychopathy	19.04	5.25	.42	.08				-.06**	.24**	.25**	.25**
4. Mental toughness	32.42	5.95	-.25	.32					-.54**	-.45**	-.49**
5. Depression	11.06	9.60	1.03	.51						.69**	.71**
6. Anxiety	9.59	8.98	1.07	.65							.74**
7. Stress	14.77	9.38	.55	-.18							
UK sample											
1. Machiavellianism	27.98	5.27	.13	.18		.33**	.52**	-.02	.10*	.08	.11*
2. Narcissism	23.41	5.31	.33	.26			.40**	.40**	-.22**	-.18**	-.11*
3. Psychopathy	18.47	5.37	.53	.19				-.03	.14**	.10*	.14**
4. Mental toughness	31.86	7.12	-.08	.15					-.65**	-.61**	-.60**
5. Depression	11.35	10.42	1.02	.31						.69**	.69**
6. Anxiety	10.85	9.36	.88	.01							.74**
7. Stress	15.05	9.13	.43	-.50							
Greece sample											
1. Machiavellianism	27.09	5.27	.29	.09		.26**	.39**	-.05	.12**	.11**	.11**
2. Narcissism	26.62	4.39	.17	.25			.32**	.28**	-.12**	-.04	-.01
3. Psychopathy	17.94	5.09	.53	.32				-.11**	.23**	.23**	.30**
4. Mental toughness	32.85	5.86	-.29	.28					-.53**	-.46**	-.49**
5. Depression	9.42	9.11	1.37	1.54						.68**	.71**
6. Anxiety	7.64	7.92	1.36	1.60							.74**
7. Stress	13.41	8.53	.69	.22							

Note. * $p < .05$, ** $p < .001$

Table 1 continued

Variable	<i>M</i>	<i>SD</i>	Skew	Kurt.	1	2	3	4	5	6	7
Italy sample											
1. Machiavellianism	24.62	5.90	.27	.04		.34**	.56**	-.15**	.17**	.15**	.21**
2. Narcissism	23.33	5.12	.32	.65			.36**	.27**	-.12**	-.03	-.05
3. Psychopathy	18.34	5.17	.60	.38				-.15**	.25**	.26**	.30**
4. Mental toughness	31.38	5.67	-.22	-.23					-.63**	-.49**	-.53**
5. Depression	11.35	9.38	.95	.48						.64**	.71**
6. Anxiety	8.27	8.16	1.36	1.69							.70**
7. Stress	16.00	9.20	.49	-.21							
Russia sample											
1. Machiavellianism	29.89	4.92	-.13	.41		.23**	.45**	.02	.20**	.20**	.23**
2. Narcissism	25.85	4.69	-.03	.84			.31**	.33**	-.06*	-.04	-.01
3. Psychopathy	20.50	4.87	.25	.13				-.03	.24**	.27**	.21**
4. Mental toughness	33.11	5.18	-.27	.64					-.45**	-.36**	-.43**
5. Depression	12.12	9.31	.82	.18						.74**	.75**
6. Anxiety	10.94	9.57	.92	.42							.76**
7. Stress	15.93	10.25	.45	-.35							
Canada sample											
1. Machiavellianism	28.70	6.11	-.15	.18		.27**	.38**	-.02	.15*	.20**	.16*
2. Narcissism	26.14	4.90	-.06	.08			.31**	.39**	-.19**	-.03	-.04
3. Psychopathy	20.56	5.69	.39	-.23				-.01	.23**	.29**	.31**
4. Mental toughness	30.53	6.11	-.01	-.31					-.57**	-.38**	-.51**
5. Depression	13.29	10.28	.68	-.30						.60**	.66**
6. Anxiety	12.40	9.38	.56	-.46							.74**
7. Stress	13.65	9.44	.41	-.72							

Note. * $p < .05$, ** $p < .001$

NARCISSIM ASSOCIATES WITH LOWER PSYCHOPATHOLOGY ACROSS CULTURES

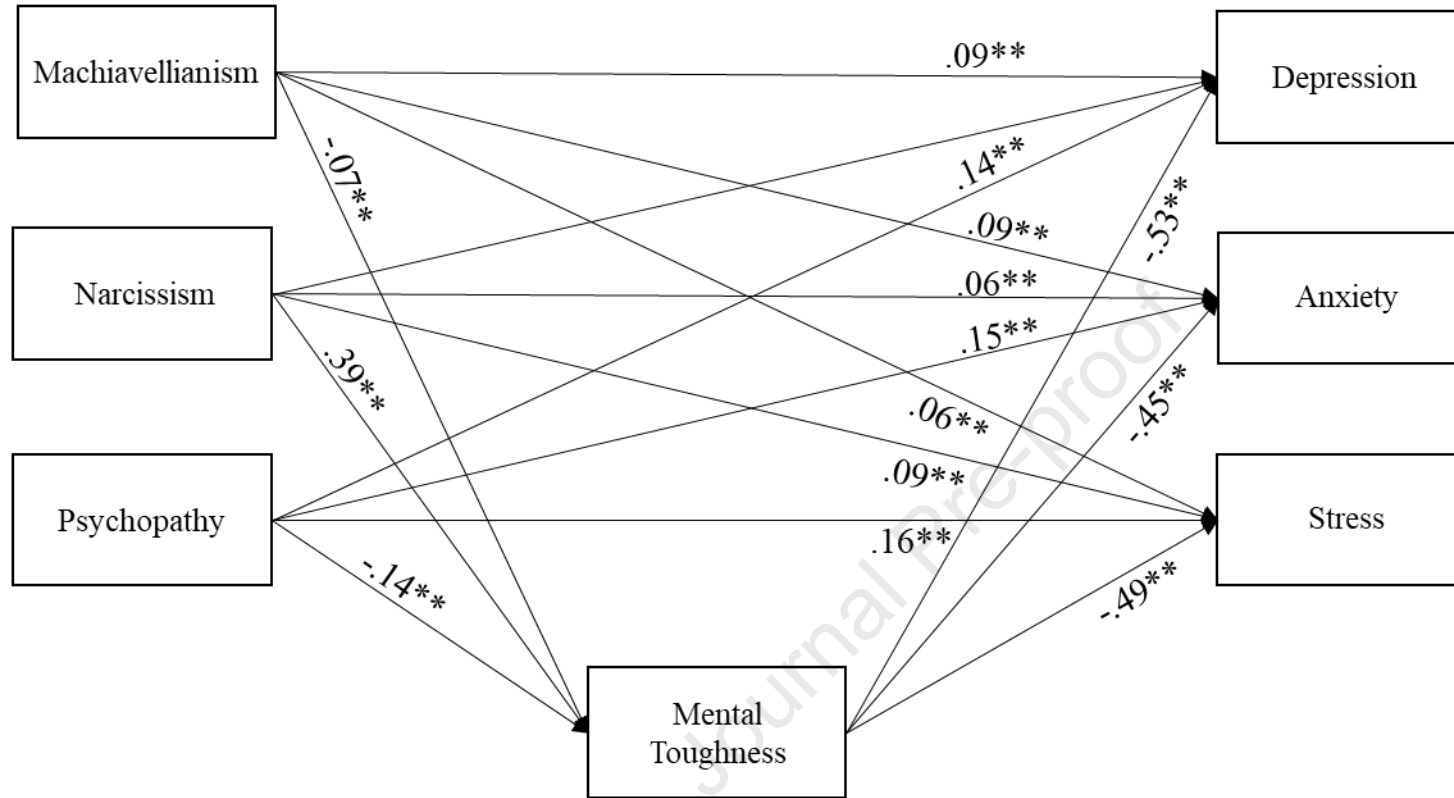


Figure 1. Mediation model depicting putative relationships between Dark Triad traits, mental toughness, depression, anxiety, and stress for the total sample. *Note.* standardized regression weights between variables are shown. Error is not indicated but was specified for endogenous variables.

* $p < .05$, ** $p < .001$ using Bootstrapping significance estimates (1000 resamples)

NARCISSIM ASSOCIATES WITH LOWER PSYCHOPATHOLOGY ACROSS CULTURES

Table 2. Specific indirect associations of Dark Triad traits with depression, anxiety, and stress through mental toughness

Indirect path	Full model ^a β (95% CI)	Country ^b				
		UK β (95% CI)	Greece β (95% CI)	Italy β (95% CI)	Russia β (95% CI)	Canada β (95% CI)
Mach > MT > Depression	.04* (.02,.05)	.08* (.04,.13)	.04* (.02,.07)	.12** (.09,.19)	.01 (-.02,.03)	.06 (.02,.11)
Mach > MT > Anxiety	.03* (.02,.05)	.08* (.04,.13)	.04* (.01,.06)	.10** (.07,.16)	.01 (-.02,.03)	.04 (.01,.08)
Mach > MT > Stress	.03* (.02,.05)	.08* (.04,.13)	.04* (.02,.06)	.10** (.07,.16)	.01 (-.02,.03)	.06 (.02,.11)
Narc > MT > Depression	-.21** (-.22,-.18)	-.31** (-.35,-.25)	-.17** (-.17,-.14)	-.23** (-.28,-.17)	-.17** (-.17,-.11)	-.26** (-.29,-.17)
Narc > MT > Anxiety	-.18** (-.19,-.15)	-.31** (-.36,-.25)	-.15** (-.15,-.12)	-.19** (-.24,-.14)	-.14** (-.16,-.09)	-.19** (-.22,-.11)
Narc > MT > Stress	-.19** (-.21,-.17)	-.31** (-.36,-.26)	-.16** (-.16,-.13)	-.20** (-.25,-.14)	-.17** (-.18,-.11)	-.25** (-.29,-.17)
Psych > MT > Depression	.07** (.05,.10)	.08** (.04,.11)	.07* (.02,.09)	.10** (.07,.15)	.06* (.02,.08)	.07* (.03,.10)
Psych > MT > Anxiety	.06** (.04,.08)	.08** (.04,.11)	.06* (.02,.08)	.09** (.06,.13)	.05* (.01,.07)	.05* (.02,.07)
Psych > MT > Stress	.07** (.05,.09)	.08** (.04,.11)	.06* (.02,.09)	.09** (.06,.14)	.06* (.02,.09)	.07* (.02,.11)

Note. ^a = model prior to constraints; ^b = model with constraints. MT = mental toughness, Mach = Machiavellianism, Narc = narcissism, Psych = psychopathy; * $p < .05$, ** $p < .001$ using Bootstrapping significance estimates (1000 resamples)

Table 3. Chi-square difference tests from the multigroup country model

Path	S-B $\chi^2(4)$	<i>p</i>
Mach > MT	41.08	< .001**
Narc > MT	16.22	.003*
Psych > MT	9.09	.058
MT > Depression	16.61	.002*
MT > Anxiety	16.40	.002*
MT > Stress	13.37	.009*
Mach > Depression	10.63	.031*
Psych > Depression	5.65	.226
Mach > Anxiety	10.52	.032*
Narc > Anxiety	3.67	.451
Psych > Anxiety	14.38	.006*
Mach > Stress	31.96	.001*
Narc > Stress	1.04	.902
Psych > Stress	5.73	.219

Note. MT = mental toughness, Mach = Machiavellianism, Narc = narcissism, Psych = psychopathy; * $p < .05$, ** $p < .001$

Table 4. Contrasts among country relating to indirect effects

Indirect path	Z	p
Mach > MT > Depression	12.01	.017*
Mach > MT > Anxiety	13.70	.008*
Mach > MT > Stress	13.48	.009*
Narc > MT > Depression	18.48	.001*
Narc > MT > Anxiety	15.98	.003*
Narc > MT > Stress	2.73	.603
Psych > MT > Depression	2.88	.576
Psych > MT > Anxiety	3.74	.442
Psych > MT > Stress	2.76	.603

Note. * $p < .05$

Author contributions

K.P. designed the study and wrote the introduction and discussion. A.D., wrote the method, conducted the analyses and wrote the results. K.P. and F.M.G., collected the data in the UK. A.D., N.D., and E.A. collected the data in Russia. R.A.P, C.M.K., and D.H.S., collected the data in Canada. S.P., T.K., and A.S. collected the data in Greece. G.C. collected the data in Italy. All authors provided critical comments in the write-up and analyses phases of the manuscript. All authors reviewed the manuscript.

Acknowledgements

We are grateful to the study participants for their contribution to this research.

Funding

The entire study was conducted with no external funding.

Declaration of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Journal Pre-proof