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# Differences in psychiatric symptoms between the UK and Greece prior to and during COVID-19: The roles of subclinical narcissism and mental toughness

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## ABSTRACT

At the onset of the novel coronavirus (COVID-19) pandemic, countries reported elevated rates of psychiatric symptoms. Previous research indicates that subclinical narcissism may reduce depression and stress through mental toughness. The researchers collected data from the United Kingdom (UK) and Greece (GR) on self-reported depression, anxiety, stress, COVID-19 related worry, subclinical narcissism, and mental toughness. Two samples, one cross-sectional ( $N = 1846$ ) and one semi-longitudinal ( $N = 184$ ), were used to compare rates of psychiatric symptoms pre and during COVID-19 across the UK and GR, and to test a path model in which subclinical narcissism reduced psychiatric symptoms through mental toughness. From pre to during COVID-19, UK participants exhibited increased depression, lower anxiety, and no change in stress, whereas GR participants showed a decrease in anxiety and stress and consistently low symptoms of depression. Subclinical narcissism exerted a negative indirect effect on psychiatric symptoms through mental toughness in both samples, but a negative total effect on anxiety and stress only in the UK sample. Findings indicate that exploring links between narcissism and prosocial traits can provide novel insights into differences in the adaptive use of personality traits in relation to mental health.

## 1. Introduction

After the onset of the novel coronavirus (COVID-19) in early 2020, millions of people suffered negative impacts, such as increased restrictions on movement, job loss, financial worries, and death of friends and family. Experience of negative events that exceed coping abilities poses increased risk of psychiatric symptoms, including depression, anxiety, and stress (Armstrong et al., 2018). Research conducted during COVID-19 found higher rates of depression among adults in China, Spain, Italy, the US, Turkey, and Denmark (14.6–48.3%; Xiong et al., 2020) than previous estimates of one-year prevalence of depression (7.2%) from one million participants from 30 different countries (Lim et al., 2018). To combat potential deleterious mental health impacts of the COVID-19 pandemic, it is necessary to identify intraindividual factors that act as protective agents against the development of psychiatric symptoms.

In order to gain a broader understanding of the psychological impacts of COVID-19, we collected semi-longitudinal and cross-sectional data, pre and during COVID-19, to (1) identify rates of depression,

anxiety, and stress among two different countries, the United Kingdom (UK) and Greece (GR), and (2) explore the degree to which subclinical narcissism indirectly predicted psychiatric symptoms through mental toughness. So far, there have been no longitudinal studies on these populations. These two populations were of particular interest as they embody different cultural characteristics: the UK as an individualistic culture, and Greece as more collectivist (Kalogeraki, 2009). Therefore, individuals from these cultures may also show different associations between personality and psychiatric symptoms in response to stressors like the pandemic. In addition to being culturally distinct, the UK and GR experienced differential impacts of COVID-19 on death rates. By June 2020, the UK had suffered approximately 37,000 deaths, whereas in Greece it was approximately 170 deaths (European Centre for Disease Prevention and Control (ECDC), 2020).

### 1.1. COVID-19 and mental health

To date, researchers assessing mental health within the time of COVID-19 have focused mainly on depression, anxiety, and stress

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(Vindegaard & Benros, 2020; Xiong et al., 2020). Different mental health patterns have been observed based on country of origin. In samples of adults from Argentina and Spain, individuals showed more severe rates of depression, anxiety, and stress after time spent in quarantine (Fernández et al., 2020; Planchuelo-Gómez et al., 2020), although psychological impact of the event remained at a constant mild to moderate level (Planchuelo-Gómez et al., 2020). Another longitudinal study in Spain conducted two weeks and then five weeks after the state of emergency announcement found that although depression increased over time, levels of anxiety and PTSD remained about the same at 20% and 15%, respectively (González-Sanguino et al., 2020). Studies conducted in Austria, China, and the Netherlands found that average ratings of psychiatric symptoms did not significantly change during the pandemic (Probst et al., 2020; van der Velden et al., 2020; Wang et al., 2020). In contrast, other countries reported reductions in psychiatric symptoms. In the U.S. and Denmark, depression and anxiety in adults significantly decreased from the initial assessment to the second assessment one month later (Kujawa et al., 2020; Sonderskov et al., 2020). In Poland, adults assessed after implementation of face mask restrictions showed significantly lower depression and anxiety than those assessed before face mask restrictions, although this was assessed in different participants (Szczesniak et al., 2020).

Several studies identified various factors that may influence mental health during COVID-19. Increased ratings of depression, anxiety, and stress were associated with high levels of neuroticism, COVID-19 related fear, and worry about going out during the pandemic (Fernández et al., 2020; Planchuelo-Gómez et al., 2020). In Spain, loneliness was the strongest predictor of increased rates of depression (González-Sanguino et al., 2020). Although average rates did not change in Austria, individuals that experienced high loneliness and stress during lockdown evinced higher rates of depression (Probst et al., 2020). In the Netherlands and China, individuals with health problems were more at risk for high depression and anxiety (van der Velden et al., 2020; Wang et al., 2020). Extant research (Fernández et al., 2020; González-Sanguino et al., 2020; Planchuelo-Gómez et al., 2020; van der Velden et al., 2020; Wang et al., 2020) indicates that individuals who experience high levels of fear, worry, and avoidance may exhibit increased rates of psychiatric symptoms (Aldao et al., 2010).

### 1.2. Psychiatric symptoms, subclinical narcissism, and mental toughness

Subclinical narcissism is part of a cluster of three correlated, yet distinct, personality domains known as the Dark Triad (Paulhus & Williams, 2002). This cluster also includes subclinical psychopathy and Machiavellianism. Of the three domains, narcissism is considered unique in its association with prosocial traits and behaviours, including mental toughness and emotional intelligence (Papageorgiou et al., 2017; Petrides et al., 2011).

The moderate positive relationship between subclinical narcissism and mental toughness has been established in several studies to date (Onley et al., 2013; Papageorgiou et al., 2017; Papageorgiou et al., 2018; Papageorgiou, Denovan, et al., 2019; Sabouri et al., 2016). Mental toughness is defined as a positive psychological resource that functions as an effective coping mechanism against stressors (Lin et al., 2017). In both longitudinal and cross-sectional studies, mental toughness has been linked with lower levels of depression, anxiety, and stress (Lin et al., 2017). Through its positive relationship with mental toughness, narcissism has been shown to reduce depression and stress in three independent samples (Papageorgiou, Denovan, et al., 2019; Papageorgiou, Gianniou, et al., 2019). Results from extant research indicate that individuals who are high in both narcissism and mental toughness may be highly goal oriented, respond proactively to stressors, and exhibit better mental health outcomes.

### 1.3. The present investigation

The current study examined psychiatric symptoms in the UK and GR pre and during COVID-19 in order to elucidate how individuals living in countries with differential experiences of the pandemic were impacted in regard to mental health. We also tested a statistical model, using cross-sectional and semi-longitudinal data, in which subclinical narcissism contributes to lower rates of depression, anxiety, and stress indirectly through mental toughness. In addition to the main aims, we explored country-level differences in COVID-related “worry” about the pandemic in relation to psychiatric symptoms. Several hypotheses were formulated, including: (1) individuals from the UK and GR will exhibit different psychiatric symptoms and worry levels based on their differential experiences of the pandemic; and (2) based on prior research indicating that subclinical narcissism is associated with lower perceived stress and depression via mental toughness (Papageorgiou, Denovan, et al., 2019; Papageorgiou, Gianniou, et al., 2019), we expect that subclinical narcissism will exert a significant negative indirect effect on depression, anxiety, and stress through mental toughness.

## 2. Method

### 2.1. Sample

The pool of participants consisted of 1846 participants in total ( $M$  age = 32.90;  $SD$  = 12.97; range = 17–86; 69.9% females). Of the total participants, 611 ( $M$  age = 27.87;  $SD$  = 11.17; range = 17–71; 70.4% females) resided in the UK and 1235 ( $M$  age = 35.39;  $SD$  = 13.08; range = 17–86; 69.6% females) resided in GR. Participants were recruited through advertisements in participating universities and social media and completed an online survey including various measures of personality and psychopathology. Data collection took place from September 2019 to January 2020 (i.e., prior to the onset of the pandemic in both countries). We will refer to this dataset as “cross-sectional sample” throughout this manuscript.

In April 2020 (after the onset of the pandemic) all participants ( $N$  = 1846) received an email inviting them to participate in an online follow up study to explore changes and predictors of mental health in both countries. A total of 184 participants ( $M$  age = 30.64;  $SD$  = 11.84; range = 17–72; 82.6% females) accepted the invitation and completed an online survey assessing levels of worry about COVID-19 outcomes and mental health. Of those participants 93 ( $M$  age = 27.89;  $SD$  = 11.94; range = 17–72; 83.9% females) resided in the UK and 91 ( $M$  age = 33.44;  $SD$  = 11.11; range = 17–60; 81.3% females) resided in GR. We will refer to this dataset as “semi-longitudinal sample” throughout this manuscript. Data quality control is described in Section I of the Supplementary material.

### 2.2. Measures

#### 2.2.1. Cross-sectional sample

Subclinical narcissism was assessed with the narcissism subscale of the Short Dark Triad questionnaire (SD3) (Jones & Paulhus, 2014). An example item of narcissism is “Many group activities tend to be dull without me.” Total mental toughness was measured with the Mental Toughness Questionnaire 10 (MTQ-10) (Papageorgiou et al., 2018). An example item of mental toughness is “I am generally able to react quickly when something unexpected happens.” Psychiatric symptoms, including depression (example item: “I felt that I had nothing to look forward to”), anxiety (example item: “I felt I was close to panic”), and stress (example item: “I tended to over-react to situations”) were measured with the Depression Anxiety Stress Scale 21 (DASS-21) (Lovibond & Lovibond, 1995). Reliability statistics are presented in Table 1. Details of Greek translations of questionnaires and a description of all measures used in the original study are included in Section I of the Supplementary material.

**Table 1**  
Descriptive statistics for cross-sectional and semi-longitudinal samples.

Variable	M	SD	Skew	$\omega$
Cross-sectional sample: UK (N = 611)				
1. Depression	11.29	10.40	1.02	0.92
2. Anxiety	10.77	9.31	0.91	0.86
3. Stress	14.99	9.09	0.44	0.84
4. Subclinical narcissism	2.60	0.60	0.34	0.74
5. Mental toughness	31.86	7.14	-0.09	0.85
Cross-sectional sample: GR (N = 1235)				
1. Depression	9.35	9.01	1.37	0.89
2. Anxiety	7.54	7.79	1.34	0.85
3. Stress	13.31	8.45	0.69	0.85
4. Subclinical narcissism	2.96	0.49	0.19	0.61
5. Mental toughness	32.86	5.86	-0.30	0.81
Semi-longitudinal sample: UK (N = 93)				
1. Time 1 depression	10.97	10.39	1.15	0.93
2. Time 2 depression	13.83	10.53	0.69	0.91
3. Time 1 anxiety	11.33	9.46	0.91	0.88
4. Time 2 anxiety	8.04	8.59	1.65	0.88
5. Time 1 stress	15.40	9.07	0.46	0.84
6. Time 2 stress	14.56	9.46	0.60	0.89
7. Time 2 worry	4.26	1.09	-0.09	0.81
8. Time 1 subclinical narcissism	2.53	0.61	0.35	0.75
9. Time 1 mental toughness	31.89	6.57	0.24	0.81
Semi-longitudinal sample: GR (N = 91)				
1. Time 1 depression	10.22	9.54	1.19	0.89
2. Time 2 depression	9.76	10.25	1.36	0.92
3. Time 1 anxiety	7.19	7.51	1.08	0.85
4. Time 2 anxiety	4.77	6.45	2.16	0.84
5. Time 1 stress	13.45	8.08	0.81	0.85
6. Time 2 stress	10.75	9.12	0.96	0.90
7. Time 2 worry	4.09	1.13	-0.14	0.82
6. Time 1 subclinical narcissism	3.02	0.52	0.49	0.64
7. Time 1 mental toughness	33.35	6.00	0.13	0.82

Note. Subclinical narcissism and mental toughness were only assessed at Time 1 for the participants that completed the follow up study.  $\omega$  = McDonald's omega.

### 2.2.2. Semi-longitudinal sample

Symptoms of depression, anxiety, and stress were assessed a second time with the DASS-21. COVID-19 related worry was assessed by adding ten questions related to worrying about: the current situation, overall economic impact, impact on society, individual and family members' physical and mental health, losing friends, job status, fitness, love life, and finding essential items. Responses to items were given on a 7-point Likert scale with 1 = *not worried at all* to 7 = *extremely worried*. An example item is: "How worried are you about the health of yourself and your family members?". The COVID-19 related worry scale achieved acceptable reliability estimates in both UK and GR samples (see Table 1). The SD3, MTQ-10, and DASS-21 were completed at Time 1. COVID-19 related worry and the DASS-21 (second assessment) were completed at Time 2. Further information regarding validity and scale structure is presented in Section I of the Supplementary material.

### 2.3. Procedure

All questionnaires were combined to form a single document and they were available online via Qualtrics Survey Software ([www.qualtrics.com](http://www.qualtrics.com)). For the cross-sectional sample, participants were recruited via advertisements throughout participating universities and social media. For the semi-longitudinal sample, participants received an email with a link to the online survey. Questionnaire completion was self-paced; participants could proceed to the subsequent page only once they had answered all items. Participants could save their responses and return to complete the study within seven days. Participants received no compensation for taking part in the study.

### 2.4. Analysis

Using the semi-longitudinal sample first, we examined psychiatric

symptoms pre and during COVID-19 from the UK and GR, and mediation models of subclinical narcissism on psychiatric symptoms through mental toughness. Subsequently, the two large UK and GR cross-sectional samples were used to verify ratings of psychiatric symptoms pre COVID-19 identified in the smaller semi-longitudinal sample, and for the purpose of replicating the mediation models tested. For COVID-19 related worry, we examined significant differences between the UK and GR on each of the 10 items, in order to distinguish the specific aspects of the pandemic that participants from these countries found differentially threatening. Differences in narcissism and mental toughness were also examined between UK and GR samples. Section II in the Supplementary material details the statistical analyses performed to test our hypotheses.

## 3. Results

### 3.1. Descriptive statistics

Means and standards deviations of the cross-sectional and semi-longitudinal samples pre COVID-19 were almost equivalent (Table 1). In the semi-longitudinal sample, Time 1 depression ( $M_{diff} = 0.33$ ), anxiety ( $M_{diff} = 0.56$ ), and stress ( $M_{diff} = 0.41$ ) in the UK were not significantly different than psychiatric symptoms reported in the large UK cross-sectional sample. Similarly, Time 1 depression ( $M_{diff} = 0.87$ ), anxiety ( $M_{diff} = 0.35$ ), and stress ( $M_{diff} = 0.14$ ) in the semi-longitudinal GR sample were not significantly different than psychiatric symptoms reported in the large GR cross-sectional sample. This indicates that, despite the smaller size of the semi-longitudinal sample, psychiatric symptoms were comparable to the larger samples gathered from these populations. Correlations of the cross-sectional and semi-longitudinal samples are reported in Section III of the Supplementary material.

### 3.2. Differences in psychiatric symptoms (pre vs. during COVID-19)

In the semi-longitudinal sample, UK participants had significantly higher symptoms of depression ( $Mdiff = 2.86$ , 95% CI [0.97, 4.75],  $t(92) = 3.01$ ,  $p = .003$ ), lower rates of anxiety ( $Mdiff = -3.29$ , 95% CI [-5.10, -1.48],  $t(92) = -3.61$ ,  $p = .000$ ), and no difference in stress ( $Mdiff = -0.84$ , 95% CI [-2.83, 1.16],  $t(92) = -0.84$ ,  $p = .406$ ) during COVID-19 versus pre COVID-19. The difference in depression represented a small effect, Cohen's  $d = 0.31$  (Cohen, 1992). The difference in anxiety represented a small effect,  $d = 0.37$ .

GR participants had significantly lower rates of anxiety ( $Mdiff = -2.41$ , 95% CI [-3.91, -0.93],  $t(90) = -3.22$ ,  $p = .002$ ), lower stress ( $Mdiff = -2.70$ , 95% CI [-4.75, -0.67],  $t(90) = -2.70$ ,  $p = .010$ ), and no difference in depression ( $Mdiff = -0.46$ , 95% CI [-2.81, 1.89],  $t(90) = 0.39$ ,  $p = .697$ ) during COVID-19 versus pre COVID-19. The difference in anxiety represented a small effect,  $d = 0.34$ . The difference in stress represented a small effect,  $d = 0.27$ .

### 3.3. Differences in personality and psychiatric symptoms (UK vs. GR)

#### 3.3.1. Cross-sectional sample (pre COVID-19)

Compared to GR participants, UK participants showed significantly higher rates of depression ( $Mdiff = 1.95$ , 95% CI [0.98, 2.91],  $t(1074.64) = 3.95$ ,  $p = .000$ ), anxiety ( $Mdiff = 3.23$ , 95% CI [2.37, 4.09],  $t(1043.80) = 7.40$ ,  $p = .000$ ), and stress ( $Mdiff = 1.67$ , 95% CI [0.81, 2.53],  $t(1140.62) = 3.81$ ,  $p = .000$ ; all equal variances not assumed). Effect size for the difference in depression was small,  $d = 0.20$ , anxiety was small,  $d = 0.37$ , and stress was small,  $d = 0.19$ .

Regarding personality, GR participants reported significantly higher mental toughness ( $Mdiff = 0.99$ , 95% CI [0.34, 1.65],  $t(1027.71) = 2.98$ ,  $p = .003$ ) and narcissism ( $Mdiff = 0.36$ , 95% CI [0.31, 0.41],  $t(1022.36) = 12.88$ ,  $p = .000$ ) than UK participants. The difference in mental toughness represented a small effect,  $d = 0.15$ , and narcissism was medium,  $d = 0.66$ .

#### 3.3.2. Semi-longitudinal sample (pre and during COVID-19)

Pre COVID-19, UK participants had significantly higher rates of anxiety than GR participants ( $Mdiff = 4.15$ , 95% CI [1.67, 6.63],  $t(174.62) = 3.30$ ,  $p = .001$ ; equal variances not assumed), but no significant difference in depression ( $Mdiff = 0.69$ , 95% CI [-2.16, 3.65],  $t(182) = 0.51$ ,  $p = .612$ ) or stress ( $Mdiff = 1.95$ , 95% CI [-0.55, 4.45],  $t(182) = 1.54$ ,  $p = .126$ ). The difference in anxiety represented approximately a medium effect,  $d = 0.48$ .

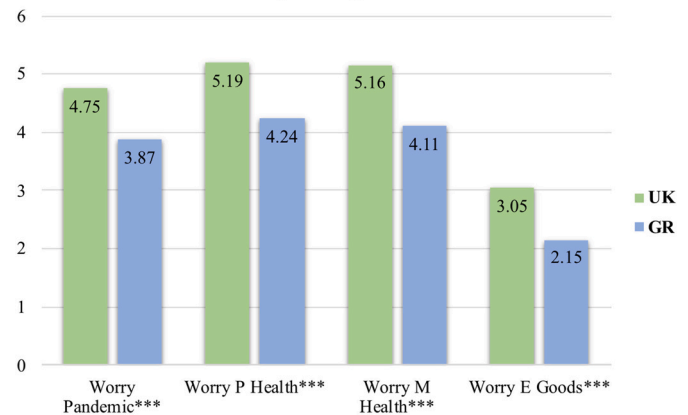
Further, GR participants reported significantly higher narcissism ( $Mdiff = 0.49$ , 95% CI [0.33, 0.66],  $t(182) = 5.89$ ,  $p = .000$ ) than UK participants, but there was not a significant difference in mental toughness ( $Mdiff = 1.46$ , 95% CI [-0.37, 3.29],  $t(182) = 1.57$ ,  $p = .118$ ). The difference in narcissism represented a large effect,  $d = 0.86$ .

During COVID-19, compared to GR participants, UK participants had significantly higher rates of depression ( $Mdiff = 4.07$ , 95% CI [1.04, 7.09],  $t(182) = 2.67$ ,  $p = .009$ ), anxiety ( $Mdiff = 3.27$ , 95% CI [1.07, 5.48],  $t(170.66) = 2.93$ ,  $p = .004$ ; equal variances not assumed), and stress ( $Mdiff = 3.81$ , 95% CI [1.11, 6.52],  $t(182) = 2.79$ ,  $p = .006$ ). Effect size for the difference in depression was small,  $d = 0.39$ , anxiety was small,  $d = 0.43$ , and stress was small,  $d = 0.41$ .

### 3.4. Differences in worry during COVID-19 (UK vs. GR)

In the semi-longitudinal sample, UK participants showed significantly greater overall worry about the current pandemic, their own and family members' physical health, their own and family members' mental health, and finding essential goods in the supermarket than GR participants (see Fig. 1). Effect size for the difference in worry about the pandemic was medium,  $Mdiff = 0.89$ ,  $p = .000$ ,  $d = 0.55$ , worry about physical health was medium,  $Mdiff = 0.95$ ,  $p = .000$ ,  $d = 0.57$ , worry about mental health was medium,  $Mdiff = 1.05$ ,  $p = .000$ ,  $d = 0.58$ , and

### Worry During COVID-19



**Fig. 1.** Bar graph of the differences in worry during COVID-19 between the UK and GR semi-longitudinal samples. UK participants reported greater worry about the pandemic,  $Mdiff = 0.89$ , 95% CI [0.42, 1.35],  $t(182) = 3.74$ ,  $p = .000$ , worry about the physical health of themselves and their family,  $Mdiff = 0.95$ , 95% CI [0.46, 1.44],  $t(182) = 3.85$ ,  $p = .000$ , worry about the mental health of themselves and their family,  $Mdiff = 1.05$ , 95% CI [0.59, 1.68],  $t(182) = 4.08$ ,  $p = .000$ , and worry about finding essential goods in the supermarket,  $Mdiff = 0.90$ , 95% CI [0.41, 1.39],  $t(177.37) = 3.65$ ,  $p = .000$  (equal variances not assumed). P Health = Physical Health, M Health = Mental Health, E Goods = Essential Goods. \*\*\* $p < .001$ .

worry about finding essential goods was medium,  $Mdiff = 0.90$ ,  $p = .000$ ,  $d = 0.54$ . There were not significant differences between the UK and GR in worry about work or studies, losing their social circle, staying fit and active, their love life, the economic impact, and the potential long-lasting negative impact of the pandemic.

### 3.5. Subclinical narcissism, mental toughness, and psychiatric symptoms

#### 3.5.1. Semi-longitudinal sample

In the semi-longitudinal UK sample, analysis of Model 1A found that subclinical narcissism positively predicted mental toughness ( $a$  weight = 3.80, 95% CI [1.69, 5.91]) and negatively predicted Time 2 depression ( $c$  weight = -3.99, 95% CI [-7.51, -0.47]). Mental toughness negatively predicted depression ( $b$  weight = -0.88, 95% CI [-1.17, -0.58]). Narcissism had a significant indirect effect ( $a*b$  weight = -3.33, 95% CI [-5.53, -1.22]) on depression through mental toughness. The direct effect (path  $c'$ ) was non-significant, supporting a partial mediation model. The final model explained 31.4% of the variance in Time 2 depression. In Model 2A, assessing mental toughness as a mediator of the narcissism-Time 2 anxiety relationship revealed a significant indirect effect ( $a*b = -1.35$ , 95% CI [-2.77, -0.14]), but non-significant direct and total effects. The final model explained 6.5% of the variance in Time 2 anxiety. Analysis of Model 3A indicated that there was a significant indirect effect of narcissism on Time 2 stress through mental toughness ( $a*b = -2.16$ , 95% CI [-3.76, -0.67]), but non-significant direct and total effects. The final model explained 13.6% of the variance in Time 2 stress.

In the semi-longitudinal GR sample, analysis of Model 1B found that there was a significant indirect effect of narcissism on Time 2 depression through mental toughness ( $a*b = -2.62$ , 95% CI [-4.16, -1.24]), but non-significant direct and total effects. The final model explained 15.7% of the variance in Time 2 depression. Similarly to the UK sample, assessing mental toughness as a mediator of the narcissism-Time 2 anxiety ( $a*b = -1.51$ , 95% CI [-2.50, -0.75]) and narcissism-Time 2 stress ( $a*b = -2.10$ , 95% CI [-3.42, -0.95]) relationships produced significant indirect effects, but non-significant direct and total effects. The final model explained 13.8% of the variance in Time 2 anxiety, and 12.3% of the variance in Time 2 stress. All figures for the semi-

longitudinal mediation models are presented in Section IV of the Supplementary material.

### 3.5.2. Cross-sectional sample

In the cross-sectional UK sample, analysis of mediation Model 4A found that subclinical narcissism positively predicted mental toughness ( $a$  weight = 4.83, 95% CI [3.97, 5.70]) and negatively predicted depression ( $c$  weight = -3.98, 95% CI [-5.33, -2.63]). Mental toughness negatively predicted depression ( $b$  weight = -0.98, 95% CI [-1.07, -0.88]). Narcissism had a significant indirect effect ( $a^*b$  weight = -4.72, 95% CI [-5.81, -3.67]) on depression through mental toughness. The direct effect was non-significant, supporting a partial mediation model. The final model explained 42.9% of the variance in depression. In Model 5A, assessing mental toughness as a mediator of the narcissism-anxiety relationship revealed a significant indirect effect ( $a^*b$  = -4.05, 95% CI [-4.93, -3.22]). Narcissism positively predicted mental toughness and negatively predicted anxiety ( $c$  weight = -2.96, 95% CI [-4.17, -1.74]). After controlling for mental toughness, there was a significant positive direct effect of narcissism on anxiety ( $c'$  weight = 1.09, 95% CI [0.02, 2.15]). The final model explained 38.1% of the variance in anxiety. Analysis of Model 6A indicated that there was a significant indirect effect of narcissism on stress through mental toughness ( $a^*b$  = -4.10, 95% CI [-5.05, -3.17]). Narcissism positively predicted mental toughness and negatively predicted stress ( $c$  weight = -1.76, 95% CI [-2.96, -0.56]). Similarly to the model with anxiety, after controlling for mental toughness, there was a significant positive direct effect of narcissism on stress ( $c'$  = 2.34, 95% CI [1.30, 3.38]). The final model explained 38.5% of the variance in stress.

In the cross-sectional GR sample, analysis of mediation Model 4B found that narcissism positively predicted mental toughness ( $a$  weight = 3.40, 95% CI [2.76, 4.04]) and negatively predicted depression ( $c$  weight = -2.12, 95% CI [-3.24, -1.19]). Mental toughness negatively predicted depression ( $b$  weight = -0.85, 95% CI [-0.92, -0.77]). Narcissism had a significant indirect effect ( $a^*b$  weight = -2.88, 95% CI [-3.56, -2.24]) on depression through mental toughness. The direct effect was non-significant, supporting a partial mediation model. The final model explained 29.2% of the variance in depression. In Model 5B, assessing mental toughness as a mediator of the narcissism-anxiety relationship revealed a significant indirect effect ( $a^*b$  = -2.27, 95% CI [-2.79, -1.74]) and direct effect ( $c'$  = 1.62, 95% CI [0.80, 2.43]), but a non-significant total effect. The final model explained 23.3% of the variance in anxiety. In Model 6B, assessing mental toughness as a mediator of the narcissism-stress relationship revealed a significant indirect effect ( $a^*b$  = -2.67, 95% CI [-3.31, -2.08]) and direct effect ( $c'$  = 2.53, 95% CI [1.67, 3.39]), but a non-significant total effect. The final model explained 27.1% of the variance in stress. All figures for the cross-sectional mediation models are presented in Section IV of the Supplementary material.

## 4. Discussion

Individual mental health outcomes in response to the COVID-19 pandemic are subject to differential COVID-19 impacts, country of residence, and individual differences in personality. In the large cross-sectional sample, individuals from the UK reported greater depression, anxiety, and stress and lower mental toughness and narcissism pre COVID-19 than those from Greece (GR). In the smaller semi-longitudinal sample, only differences in anxiety and narcissism were found between the UK and GR. This discrepancy may have been due to small sample size of the semi-longitudinal data. Effect sizes of differences in depression, stress, and mental toughness were small, so the smaller sample may have lacked enough power to detect these differences (Button et al., 2013). Additionally, means and standard deviations of psychiatric symptoms from the cross-sectional and semi-longitudinal samples were almost equivalent, suggesting the differences are in fact significant. During the pandemic, semi-longitudinal and cross-sectional data indicated that

British individuals reported higher depression, anxiety, and stress than Greek individuals. Effect sizes of differences in depression and stress during the pandemic were almost double that of the initial assessment.

When individuals responded to the second wave of the survey (May–July 2020), the death toll in the UK was drastically higher than in GR (ECDC, 2020). Individuals in these two countries may have perceived the pandemic as differentially threatening. In addition to increased rates of depression during the pandemic, individuals from the UK expressed significantly greater worry about the pandemic, their own and family members' physical and mental health, and finding essential goods in supermarkets. Experimental research on stress reactions found that individuals who perceive negative life events as "summative", such that they focus on the implications of an entire situation rather than its parts, showed increased stress levels (Seta et al., 2002). Therefore, as individuals from the UK experienced greater worry about a number of COVID-related impacts, a summative view may have contributed to increased depression and higher overall anxiety and stress than individuals in GR. In applied settings, it may be beneficial to develop interventions or communicate campaigns to prompt people to adopt an averaging (i.e. a high stress situation is considered separate to regular stress, resulting in a lower mean stress level), rather than summative, process to deal with stress during COVID-19.

On the other hand, participants from the UK and GR showed reductions in anxiety during COVID-19. Greek participants additionally reported lower stress. Studies in the U.S., Denmark, and Poland provided preliminary evidence of improvements in mental health during COVID-19 (Kujawa et al., 2020; Sonderskov et al., 2020; Szczesniak et al., 2020). In the U.S., initial reports of pandemic-related negative events did not predict changes in mental health at follow-up when controlling for baseline symptoms. This indicates pandemic-related events may not have lasting effects on mental health (Kujawa et al., 2020). Research on disaster mental health preparedness has suggested that individuals have poor mental health outcomes after disasters partly due to a lack of psychological preparedness (Roudini et al., 2017). The UK and GR governments detailed plans for furlough packages, job protection schemes, and measures to restrict the spread of the virus. This response may have mitigated initial fears and uncertainty surrounding the pandemic.

Furthermore, intraindividual traits, such as subclinical narcissism and mental toughness, influence mental health outcomes (Soto, 2019). The current study extends previous findings of the negative indirect effect of narcissism on depression through mental toughness (Papa-georgiou, Denovan, et al., 2019) by showing that this path model applies across samples of adults from different countries and additionally to anxiety and stress. Although narcissism was not directly associated with depression at Time 2 for Greek individuals, there was still a significant indirect path through mental toughness. Narcissism may be particularly adaptive in regards to depression because it primarily encapsulates traits of self-belief. A recent meta-analysis found that self-enhancement was positively associated with psychological adjustment across sex, age, cohort, and culture (Dufner et al., 2019).

Interestingly, in the large cross-sectional samples, subclinical narcissism had a negative indirect effect on both anxiety and stress through mental toughness, but when mental toughness was controlled for narcissism had a positive direct effect on anxiety and stress. These results suggest that in this case, mental toughness may operate as a suppressor variable. A suppression effect occurs within a mediation model when direct and indirect effects have opposite signs (MacKinnon et al., 2000; Tzelgov & Henik, 1991), and can occur even when the total effect is non-significant, as in the GR sample (Rucker et al., 2011). British and Greek individuals appear to differ in that narcissism, on its own, reduces anxiety and stress levels for individuals in the UK. Whereas only Greek individuals that have both high mental toughness and narcissism show lower anxiety and stress. This implies that individuals in GR that are high in both narcissism and mental toughness may respond adaptively to stressors like the current pandemic. These results

have further implications for the development of interventions, which may promote adaptive aspects of narcissism and mental toughness in order to reduce psychiatric symptoms in response to major life stressors like the COVID-19 pandemic.

The current study is limited by use of self-report data, such that self-report is influenced by common-method variance (Podsakoff et al., 2003), as well as social desirability, particularly in regards to items assessing “dark” traits like narcissism and “positive” traits like mental toughness. Another limitation is sample size of the semi-longitudinal data. However, this was offset by inclusion of a large cross-sectional sample, which validated ratings of psychiatric symptoms pre COVID-19. Further, sociodemographic variables other than age and gender were not assessed, and the UK sample was significantly younger than the GR sample. The associations between age and psychiatric symptoms were assessed in both samples. Age was negatively associated with psychiatric symptoms, such that younger adults reported lower rates of depression, anxiety, and stress. However, the UK sample, which was significantly younger, reported higher psychiatric symptoms than the GR sample, indicating lower average age did not unduly influence reported psychiatric symptoms. Validation checks (Lynam et al., 2011) were not included in the surveys to ensure reliable completion of measures. However, strict data screening measures ensured there were not any unreliable responses included in the final data set. A final limitation is that we did not assess narcissism and mental toughness longitudinally to see if changes in mean levels of these traits predict changes in psychopathology during COVID-19. This may be an endeavour for future research in this area.

#### 4.1. Conclusions

The present investigation provides new, multi-country evidence on mental health prior to and during the COVID-19 pandemic, and on the influence of “dark” personality traits on mental health. Results highlight that associations between personality and psychopathology can change according to context. Modern collectivistic cultures like Greece may foster the development of mentally tough individuals whom respond adaptively to stress, whereas individualistic cultures like the UK may engender the adaptive abilities of individuals with darker personality traits. This supports the notion that personality is a dynamic system in which a wide spectrum of traits interacts in both adaptive and maladaptive ways with our overall environment and social world.

#### CRedit authorship contribution statement

**Taylor E. Truhan:** Conceptualization, Writing – original draft, Writing – review & editing, Visualization, Formal analysis, Methodology. **Foteini-Maria Gianniou:** Investigation, Resources, Data curation, Project administration. **Kostas A. Papageorgiou:** Conceptualization, Writing – original draft, Writing – review & editing, Methodology, Supervision.

#### Declaration of competing interest

All authors declare no conflicts of interest.

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#### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.paid.2021.111308>.

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