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# Do "Dark" Personality Features Buffer Against Adversity? The Associations Between Cumulative Life Stress, the Dark Triad, and Mental Distress

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**Abstract**

Stressful life events have a major impact on adverse mental health outcomes, although not all individuals are equally affected. According to the buffering hypothesis, there may be personality traits that protect individuals against mental distress in the face of adversity, playing thus a moderating role between life stressors and mental distress. In the present online study ($N = 574$), Dark Triad of personality (i.e., Machiavellianism, narcissism, and psychopathy) were investigated as moderators between cumulative stressful life events and mental distress (i.e., psychosis, anxiety, and depression). Those who experienced more stressful events during lifetime, and scored higher in Machiavellianism, had higher scores on a psychosis instrument. Narcissism buffered the impact of stressful events on psychosis and depression. The results are discussed in terms of unique profiles associated with each of the traits.

**Keywords**

Dark Triad, stressful life events, mental distress, moderation

## Introduction

Stressful life events have a substantial effect on several mental health outcomes, including depression, anxiety, and psychosis (Bebbington et al., 1993; Kendler, Hettema, Butera, Gardner, & Prescott, 2003; Kopala-Sibley et al., 2016). These events can take the form of a one-off traumatic experience (e.g., Kopala-Sibley et al., 2016) or exert their influence in a cumulative manner over a longer time period (Seery, Holman, & Silver, 2010). Interestingly, there are significant individual differences in the outcomes of stressful life events as not everyone is adversely affected (e.g., Kopala-Sibley et al., 2016; Laceulle, Rentfrow, Lamb, & Alisic, 2018). According to the buffering hypothesis, there may be key factors (e.g., personality traits, social support) that could protect individuals against the impact of adverse life events. For instance, emotional intelligence (Armstrong, Galligan, & Critchley, 2011) and positive affect (Kopala-Sibley et al., 2016; Peng et al., 2012) have been suggested as buffers against mental distress after stressful life events. Despite the wide interest in possible buffers against adversity, there has been less focus on investigating socially negative personality traits, such as those represented by the Dark Triad (i.e., narcissism, Machiavellianism, and psychopathy; Paulhus & Williams, 2002) from a buffering perspective.

The Dark Triad is a constellation of traits that share the core features of selfish and cold interpersonal orientation. The unique features of each of the traits are scheming, cynical nature (i.e., Machiavellianism), antisocial impulsivity and callousness (i.e., psychopathy), and grandiose, inflated self-view (i.e., narcissism). Due to the cold, aloof interpersonal nature of the Dark Triad, there has been some research interest in investigating the traits in relation to coping-related variables, such as empathy (e.g., Jonason, Lyons, Bethell, & Ross, 2013), alexithymia (e.g., Cairncross, Veselka, Schermer, & Vernon, 2013), and positive affect (Miller et al., 2010). There are several reasons to expect that Machiavellianism and psychopathy have a negative association, and narcissism a positive association, with coping with stressful life events.

First, with regard to emotional intelligence/empathy, research has found that Machiavellianism and psychopathy (more so than narcissism) are associated with lower

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empathy (Jonason & Krause, 2013; Jonason et al., 2013; Petrides, Vernon, Schermer, & Veselka, 2011). As emotional intelligence is an important factor in coping with stress (Armstrong et al., 2011), those high on Machiavellianism and psychopathy are expected to struggle more as a result of stressful events. Second, Machiavellianism and psychopathy have a positive correlation, and narcissism a negative correlation, with an alexithymia measure (Cairncross et al., 2013). More specifically, Machiavellianism and psychopathy have been linked to an aspect of alexithymia, heightened externally oriented thinking (i.e., avoiding to think about one's own emotions; Jonason & Krause, 2013), which could result in worse coping after stressful events. Third, Machiavellianism and psychopathy have been associated with lower positive mood (Egan, Chan, & Shorter, 2014) and lower emotional expressivity (Lyons & Brockman, 2017), which could, again, hinder coping with stress. Together, the findings on empathy/mood would suggest that those high on Machiavellianism and psychopathy may be less buffered against stressful life events and experience more mental distress as a result.

Furthermore, empirical literature on stress and well-being provide additional support for the idea that narcissism relates to decreased, and Machiavellianism and psychopathy to increased mental distress as a result of life stress. Machiavellianism and psychopathy are directly connected to negative mental health and stress outcomes, and narcissism has either no association or is linked to positive outcomes (Aghababaei & Błachnio, 2015; Jonason, Baughman, Carter, & Parker, 2015; Láng, Birkás, Martin, Nagy, & Kallai, 2017; Love & Holder, 2014; Noser, Zeigler-Hill, & Besser, 2014; Richardson & Boag, 2016; Sedikides, Rudich, Gregg, Kumashiro, & Rusbult, 2014; Stead, Fekken, Kay, & McDermott, 2012, although see Miller et al., 2010 and Kajonius & Björkman, 2018 for differences between vulnerable and grandiose narcissism). Moreover, narcissism has a relationship with increased mental toughness and reduced emotional reactivity to stress, whereas Machiavellianism and psychopathy are linked to decreased mental toughness and more emotional reactivity to stress (Birkás, Gács, & Csathó, 2016; Onley, Veselka, Schermer, & Vernon, 2013). Thus, we would expect that narcissism acts as a buffer between cumulative life stress and mental distress, whereas Machiavellianism and psychopathy could lead to worsened mental health outcomes after stress.

In the present study, we investigated the role of the Dark Triad of personality in moderating the influence of cumulative stressful life events on depression, anxiety, and psychosis. We chose the outcome variables because (a) they vary in a continuum in nonclinical populations and (b) there is a large amount of overlap between these three forms of mental distress, especially, after an exposure to traumatic events (Wigman et al., 2012). As previous literature has found that some of the Dark Triad traits (i.e., psychopathy and Machiavellianism) have a negative association, and narcissism has a positive association, with mental health and coping, we expected that narcissism acts as a buffer, and Machiavellianism and psychopathy as a catalyst, between stressful life events and mental distress. Importantly, we tested these associations in a nonclinical, nonforensic sample, which is crucial in understanding how personality functions in everyday life. To capture the diversity of life circumstances influencing exposure to stressful events (Benjet et al., 2016), we wanted to capture a more heterogeneous, representative sample using the Internet as a tool for recruitment.

## Method

### Participants and Procedure

The participants were 574 volunteers ($M_{age}$ = 25.48, $SD$ = 10.14; 468 women, 106 men; 351 from the United Kingdom; 141 from Australia, the United States, and Canada; 82 from mainland European countries), completing an online study on "Personality, Stressful Life Events, and Mental Health." To capture a heterogeneous sample, the study was advertised through the researcher's social networks, through an online participation forum, and to first year students at a university in the North West of England, who could participate in exchange for course credits. Participants signed an online consent form and, after completing the survey, were directed to a debrief page.

### Materials

We used the 27-item Short Dark Triad (SD3; Jones & Paulhus, 2014) questionnaire to measure the Dark Triad. The SD3 has a 5-point Likert-type scale (1 = *strongly disagree, 5 = strongly agree*) and nine items for each trait. Examples of statements include "Most people can be manipulated," (i.e., Machiavellianism, Ω = .80, 95% confidence interval (CI) = [.76, .83]); "I know that I am special because everyone keeps telling me so" (i.e., narcissism, Ω = .72, 95% CI = [.69, .75]); and "People who mess with me always regret it" (i.e., psychopathy, Ω = .75, 95 % CI = [.71, .79]). This measure has been used widely as a short instrument for the Dark Triad and has demonstrated good psychometric validity (Maples, Lamkin, & Miller, 2014).

We measured depression and anxiety with the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983). This questionnaire has 14 items, seven for each outcome, measured with a 4-point Likert-type scale (0 = *not at all*, 3 = *most of the time*) for frequency within the past 2 weeks. The statements include "I feel tense or wound up" (anxiety, Ω = .75, 95% CI = [.82, .87]) and "I still enjoy things I used to enjoy" (depression, Ω = .77, 95% CI = [.75, .79]). The HADS has demonstrated good validity and reliability in subsequent studies (e.g., Bjelland, Dahl, Haug, & Neckelmann, 2002).

Psychosis was measured using the Oxford–Liverpool Inventory of Feelings and Experiences (O-LIFE; Mason & Claridge, 2006). Participants were given a list of questions, regarding their thoughts, feelings, experiences, and preferences; they then answered *yes* (score of 1) or *no* (score of 0) to each of these. Examples included "Are you a person whose mood goes up and down easily" and "do you think that you could learn to read other's minds if you wanted to" ($\Omega = .77$, 95% CI = [.74, .81]). A higher score in the scale is indicative of higher levels of psychosis proneness. O-LIFE demonstrates good psychometric validity (Fonseca-Pedrero, Ortuño-Sierra, Mason, & Muñiz, 2015).

There are several measures that attempt to investigate the exposure to stressful life events, but little consensus on the comprehensiveness of the measures in a diverse population. To investigate the exposure to stressful life events in a wide Internet sample consisting of students and nonstudents from several countries, we constructed a 25-item scale from some of the existing measures. By doing this, we were hoping to encompass a broad spectrum of traumatic events that could be relevant to a diverse sample. We used the List of Life-Threatening Experiences (LTE; Brugha, Bebbington, Tennant, & Hurry, 1985), The Life Events Scale for Students (LESS; Clements & Turpin, 1996), Stressful Life Events Screening Questionnaire (SLESQ; Goodman, Corcoran, Turner, Yuan, & Green, 1998), The Traumatic Life Events Questionnaire (TLEQ; Kubany et al., 2000), and the Revised Stressful Life Event Questionnaire (RSLEQ; Sali et al., 2013) in the scale construction. Some of the items in the exiting scale encompass a broad range of similar types of events (e.g., sudden death of close friend or a loved one; Kubany et al., 2000). Questions like these are vague in that they could include the death of a child, parent, close relative, friend, and so on. Because multiple exposure to the same kind of interpersonal trauma (e.g., death) can result in elevated symptoms of trauma (e.g., Green et al., 2000), we wanted to separate these kinds of events into several questions (i.e., death of parent, child, partner, or other close friend or relative). Appendix A lists the items and the scale that featured each item. Participants scored a point for each question where the stressor had occurred, and the points were summed together to form an index of stressful life events.

### *Analytical Strategy*

Structural equation modeling (SEM) with multiple-indicator latent variables was used to study the Dark Triad traits as moderators between cumulative life stress events and anxiety, depression, and psychosis. We controlled for participant sex and age, as both of these are associated with the Dark Triad (Muris, Merckelbach, Otgaar, & Meijer, 2017) and mental distress (Salk, Hyde, & Abramson, 2017). Latent variables are existing constructs but unmeasured using the current data at hand and their use can accommodate measurement error in those constructs when the researcher has recorded several indicators of a hypothesized latent construct. Although almost all the latent constructs were measured on Likert-type scale having less than 5-points, these indicators were modeled as continuous variables because treating them discrete caused severe estimation problems for the model and because their distributions were reasonably normal. Indicators for the construct psychosis were treated as binary indicators. With respect to all latent variables, the first question was used as a marker indicator to set the scale for a latent, and hence, its loading onto respective latent variables was fixed to unity. Cumulative life stress events, such as the covariates participant sex and age, were treated as an observed manifest variable because by definition it was a simple sum of the stressors encounter during lifetime. The model also assumed residual covariances between the latent Dark Triad traits as well as between the latent variables describing anxiety, depression, and psychosis. Furthermore, participants' country was used as a design-based clustering factor to obtain unbiased estimates and robust standard errors (McNeish, 2014).

The model parameters and their standard errors were estimated by robust maximum likelihood estimator (MLR), insensitive to nonnormal data (Muthén & Muthén, 2008-2015). The moderating influence of Dark Triad on how cumulative life stress events are associated with anxiety, depression, and psychosis was estimated using the latent moderated structural (LMS) equations method (Klein & Moosbrugger, 2000). The model can only be estimated using raw individual data, and hence, no commonly used chi-square test and fit indexes were available to assess global model fit to the data because means, variances, and covariances are not sufficient for the estimation of current model (Edwards, Wirth, Houts, & Xi, 2012). For the same reason, modification indices or model residuals for model re-evaluation were not available for the current model. Analysis was conducted with MPlus version 8 (Muthén & Muthén, 1988/2017).

## Results

In Table 1, we present the descriptive statistics and cross-correlations for all of the variables. Machiavellianism and psychopathy had significant, positive correlations with all the mental health variables, and psychopathy had a significant, positive correlation with stressful life events. Narcissism was significantly, negatively correlated with all the mental health variables. In Table 2, we report the estimated model parameters of main interest for the structural equation model. We found that the influence of cumulative stress events on psychosis and depression, but not on anxiety, was moderated by Dark Triad traits (Table 2). One unit increase in Machiavellianism increased the strength of the relationship between stress events and psychosis (i.e., its regression slope) by 0.509 (95% CI = [0.066, 0.952]) units, whereas one unit increase in narcissism reduced it by 0.054 (95% CI = [0.107,

**Table 1.** Descriptive Statistics and Correlations for the Dark Triad, Stressful Life Events, and Mental Health.

| | *M* | *SD* | 1. | 2. | 3. | 4. | 5. | 6. |
|---|---|---|---|---|---|---|---|---|
| 1. Machiavellianism | 2.87 | 0.67 | — | | | | | |
| 2. Narcissism | 2.60 | 0.59 | .33** | — | | | | |
| 3. Psychopathy | 2.13 | 0.60 | .58** | .33** | — | | | |
| 4. Stressful life events | 3.96 | 2.95 | .01 | .06 | .13** | — | | |
| 5. Anxiety | 2.31 | 0.63 | .12** | −.13** | .16** | .13** | — | |
| 6. Depression | 1.67 | 0.49 | .11** | −.23** | .13** | .20** | .59** | — |
| 7. Psychosis | 16.58 | 6.97 | .21** | −.10* | .29** | .16** | .54** | .53** |

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

**Table 2.** The Selected Results of the Structural Equation Model Examining the Potential Moderating Influence of Dark Triad Traits on How Cumulative Life Stress Events Is Associated With the Three Variables of Mental Distress.

| | β | *SE* | *z* | *p* |
|---|---|---|---|---|
| Structural coefficients | | | | |
| Anxiety | | | | |
| Age | −0.012 | 0.002 | −5.044 | <.0001 |
| Sex | 0.147 | 0.031 | 4.761 | <.0001 |
| Stress | 0.034 | 0.009 | 3.815 | <.0001 |
| Machiavellianism | −0.337 | 0.205 | −1.641 | .101 |
| Narcissism | −0.188 | 0.068 | −2.762 | .006 |
| Psychopathy | 0.458 | 0.206 | 2.224 | .026 |
| Machiavellianism × stress | 0.067 | 0.043 | 1.548 | .122 |
| Narcissism × stress | −0.024 | 0.026 | −0.914 | .361 |
| Psychopathy × stress | −0.03 | 0.038 | −0.795 | .426 |
| Depression | | | | |
| Age | 0.00 | 0.001 | −0.548 | .584 |
| Sex | 0.02 | 0.023 | 0.853 | .394 |
| Stress | 0.032 | 0.011 | 3.011 | .003 |
| Machiavellianism | 0.161 | 0.264 | 0.608 | .543 |
| Narcissism | −0.352 | 0.017 | −21.159 | <.0001 |
| Psychopathy | 0.249 | 0.142 | 1.754 | .079 |
| Machiavellianism × stress | 0.003 | 0.082 | 0.036 | .971 |
| **Narcissism × stress** | **−0.033** | **0.017** | **−1.932** | **.053** |
| Psychopathy × stress | 0.015 | 0.046 | 0.331 | .740 |
| Psychosis | | | | |
| Age | −0.016 | 0.008 | −1.964 | .049 |
| Sex | 0.295 | 0.068 | 4.352 | <.0001 |
| Stress | 0.154 | 0.015 | 10.37 | <.0001 |
| Machiavellianism | −2.84 | 1.843 | −1.541 | .123 |
| Narcissism | 0.058 | 0.151 | 0.384 | .701 |
| Psychopathy | 2.276 | 1.189 | 1.913 | .056 |
| **Machiavellianism × stress** | **0.509** | **0.226** | **2.254** | **.024** |
| **Narcissism × stress** | **−0.054** | **0.027** | **−1.987** | **.047** |
| Psychopathy × stress | −0.261 | 0.181 | −1.445 | .148 |
| Machiavellianism | | | | |
| Age | −0.007 | 0.001 | −9.81 | <.0001 |
| Sex | −0.121 | 0.019 | −6.446 | <.0001 |
| Narcissism | | | | |
| Age | −0.007 | 0.002 | −3.798 | <.0001 |
| Sex | −0.214 | 0.027 | −7.829 | <.0001 |
| Psychopathy | | | | |
| Age | −0.009 | 0.001 | −15.3 | <.0001 |
| Sex | −0.294 | 0.019 | −15.714 | <.0001 |

*Note*. Significant interactions are highlighted in bold. For full results, please see Appendix B.

−0.001]) units. Moreover, one unit increase in narcissism reduced the strength of the relationship between stress events and depression by 0.033 (95% CI = [−0.067, 0.000]) units. Of the Dark Triad traits, psychopathy did not moderate the relationship between stress and any of the mental distress variables studied. Instead, it had a direct relationship with anxiety, by increasing its scores (β = 0.458, 95% CI = [0.054, 0.861]). Moreover, psychopathy also had statistically marginally significant direct associations with the increasing scores of depression (β = 0.249, 95% CI = [−0.029, 0.527]) and psychosis (β = 2.276, 95% CI = [−0.056, 4.607]). Machiavellianism was not associated with depression and anxiety, and increase in narcissism decreased the scores on anxiety (β = −0.188, 95% CI = [−0.322, −0.055]).

## Discussion

Our findings suggest that especially Machiavellianism may predispose individuals to mental distress after cumulative stress events during life, particularly, in terms of higher psychotic symptoms. Narcissism, in turn, may buffer the effect of cumulative stress on psychosis and depression, aiding in coping with adversity (although the effect sizes for narcissism were relatively small and should be treated with caution). Although psychopathy did not moderate any of the relationships, it did have a direct relationship with anxiety. Broadly speaking, the findings are in line with previous research that suggests that Machiavellianism and psychopathy are related to increased vulnerability, and narcissism to decreased vulnerability, to stress and poor mental health outcomes (Aghababaei & Błachnio, 2015; Jonason et al., 2015; Láng et al., 2017; Love & Holder, 2014; Noser et al., 2014; Richardson & Boag, 2016; Sedikides, et al., 2004; Stead et al., 2012).

The finding that Machiavellianism may accentuate the effect of cumulative life stress on psychosis proneness is interesting, although perhaps not surprising considering other proximate features associated with the trait. One of the central characteristics of Machiavellianism is the perception of the world as a hostile place, and individuals high in this trait have a deep distrust in others (Christie & Geis, 1970). Distrust is characteristic of psychosis as well, which could stem from a host of adverse events, both recent and past (Beards et al., 2013). Perhaps when cumulative major stressors happen to a high Machiavellian individual, their views of the world as a hostile place are confirmed, predisposing them to psychosis. Recent studies found that Machiavellianism was associated with disordered thinking and schizotypal traits (Láng et al., 2017; Monaghan, Bizumic, & Sellbom, 2016), which are very similar to characteristics of psychosis. Together with our findings, this suggests that rather than being a buffer, Machiavellianism could to act as a catalyst between stressors and propensity for developing psychosis.

Although psychopathy had a direct relationship with all of the mental distress variables, it did not moderate the associations between cumulative stress and mental distress. One explanation for this could be heterogeneity of psychopathy construct, which we did not investigate here. According to the two factor–structure model of psychopathy, the trait consists of secondary (i.e., impulsivity, risk-taking behaviors) and primary (i.e., callous, unemotional predisposition) psychopathy. Primary psychopathy has been associated with low guilt and shame proneness (Lyons, 2015), which could relate to higher resilience after life stressors. Secondary psychopathy, in turn, has a relationship with increased vulnerability (Miller et al., 2010). We suspect that higher scores on secondary psychopathy would predispose individuals to more mental distress after adversity, whereas primary psychopathy could act as a buffer. In a similar manner, there may be differences in narcissism subfacets with regard to coping with stress. A recent study found that vulnerable (but not grandiose) narcissism related to increased perceived stress (Kajonius & Björkman, 2018). There are good grounds to expect that grandiose but not vulnerable narcissism would be a buffer against mental distress after trauma.

This brings us to the limitations to our study. First, we used a short instrument for the Dark Triad, which did not allow for splitting any of the Dark Triad traits into subfacets (see, for example, Jonason, Jones, & Lyons, 2013; Jonason et al., 2013; Monaghan et al., 2016). It would be useful to replicate the present study, using longer instruments, and investigating different aspects of the three traits. Second, the measure we used for stressful life events did not separate between controllable or uncontrollable stress. Perhaps, individuals who have high levels of the Dark Triad create stressful environments as a result of their personality features. This could have an association with a range of controllable stressful life events, such as illness, accidents, and divorce. Future studies should use a more sophisticated stressful life event measure, investigating different types of stress (e.g., controllable/uncontrollable), as well as how perceptions of the stressfulness of the events may affect the outcomes. Third, we used a cross-sectional design, where causality between the variables is unclear. For example, it is possible that psychopathy and Machiavellianism contribute to creating stressful life events, such as relationship break-ups (Jones & Weiser, 2014), road accidents (Burtăverde, Chraif, Aniței, & Mihăilă, 2016), self-inflicted negative health outcomes (Jonason et al., 2015), miscarriages (Jonason & Lavertu, 2017), and being a victim of bullying (Linton & Power, 2013). Indeed, psychopathy and Machiavellianism had an association with increased experience of stressful events. Rather than investigating cumulative life stress, future research could look at the influence of the Dark Triad in coping after a single traumatic life event (see, for

example, Kopala-Sibley et al., 2016). This would allow some control over the relationship between the Dark Triad and stressful life events. Finally, we utilized a diverse online sample through social networks and participant recruitment website, which may introduce some self-selection biases (Nosek, Banaji, & Greenwald, 2002). However, reviews of Internet samples have demonstrated that the findings can be as reliable and valid as research on more specified off-line samples (Gosling, Vazire, Srivastava, & John, 2004), and the benefits of using Internet samples outweigh the costs (Gosling & Mason, 2015).

Despite these limitations, we have provided new evidence for the relationships between cumulative life stress, the Dark Triad, and mental distress. We highlight the importance of investigating nonforensic, nonclinical populations, as the findings can be understood in terms of how the effects of stress covary with personality and mental distress in a normal continuum. Our results add to a growing body of research interested in investigating personality as a buffer or a diathesis after severe stressors. The Dark Triad is associated both with vulnerability and resistance toward mental distress, emphasizing the heterogeneous outcomes linked to each of the three traits.

## Appendix A

### *A List of Stressful Life Events*

1. Divorced or separated from long-term serious relationship
2. Parental divorce
3. Parent incarcerated
4. Parent institutionalized in an inpatient mental health ward
5. Death of your child
6. Death of your parent
7. Death of a spouse or a long-term partner
8. Death of another close relative or a friend
9. Was part of a serious accident
10. Witnessed an accident or serious crime
11. Was a victim of interpartner violence (domestic violence)
12. In a region when it was hit by a natural disaster
13. Been falsely accused of a crime
14. Been in a terrorist attack
15. Serious illness of someone close to you
16. Had a serious illness
17. Had an unwanted pregnancy
18. Received an abortion
19. Suffered from an addiction
20. Family member suffered from an addiction
21. Been the victim of severe bullying or discrimination
22. Been raped or sexually assaulted
23. Been seriously attacked
24. A close family member or friend was the victim of s serious crime
25. Lived in a war zone

## Appendix B

The Results of the Structural Equation Model Examining the Potential Moderating Influence of Dark Triad Traits on How Cumulative Life Stress Is Associated With the Three Variables of Mental Distress.

| | β | *SE* | *z* | *p* |
|---|---|---|---|---|
| Factor loadings | | | | |
| Machiavellinism | | | | |
| M1 | 0.331 | 0.05 | 6.631 | <.0001 |
| M2 | 0.685 | 0.041 | 16.581 | <.0001 |
| M3 | 0.597 | 0.021 | 29.071 | <.0001 |
| M4 | 0.359 | 0.029 | 12.564 | <.0001 |
| M5 | 0.704 | 0.02 | 34.888 | <.0001 |
| M6 | 0.665 | 0.047 | 14.033 | <.0001 |
| M7 | 0.480 | 0.026 | 18.307 | <.0001 |
| M8 | 0.511 | 0.023 | 22.382 | <.0001 |
| M9 | 0.491 | 0.043 | 11.538 | <.0001 |
| Narcissism | | | | |
| N1 | 0.497 | 0.037 | 13.609 | <.0001 |
| N2 | 0.411 | 0.089 | 4.608 | <.0001 |
| N3 | 0.649 | 0.014 | 47.467 | <.0001 |
| N4 | 0.593 | 0.025 | 24.157 | <.0001 |
| N5 | 0.522 | 0.015 | 35.848 | <.0001 |
| N6 | 0.327 | 0.048 | 6.806 | <.0001 |
| N7 | 0.343 | 0.021 | 16.562 | <.0001 |
| N8 | 0.413 | 0.095 | 4.356 | <.0001 |
| N9 | 0.511 | 0.052 | 9.904 | <.0001 |
| Psychopathy | | | | |
| P1 | 0.548 | 0.015 | 36.819 | <.0001 |
| P2 | 0.265 | 0.092 | 2.879 | .004 |
| P3 | 0.629 | 0.041 | 15.47 | <.0001 |
| P4 | 0.526 | 0.014 | 36.294 | <.0001 |
| P5 | 0.532 | 0.018 | 29.225 | <.0001 |
| P6 | 0.676 | 0.016 | 42.609 | <.0001 |
| P7 | 0.234 | 0.039 | 6.054 | <.0001 |
| P8 | 0.422 | 0.03 | 14.262 | <.0001 |
| P9 | 0.668 | 0.014 | 48.341 | <.0001 |
| Psychosis | | | | |
| PS1 | 0.586 | 0.046 | 12.78 | <.0001 |
| PS2 | 0.640 | 0.036 | 17.99 | <.0001 |
| PS3 | 0.554 | 0.037 | 15.054 | <.0001 |
| PS4 | 0.669 | 0.018 | 36.847 | <.0001 |
| PS5 | 0.480 | 0.086 | 5.579 | <.0001 |
| PS6 | 0.602 | 0.012 | 50.271 | <.0001 |
| PS7 | 0.551 | 0.043 | 12.68 | <.0001 |
| PS8 | 0.572 | 0.046 | 12.366 | <.0001 |
| PS9 | 0.761 | 0.011 | 71.392 | <.0001 |
| PS10 | 0.608 | 0.058 | 10.433 | <.0001 |
| PS11 | 0.649 | 0.009 | 74.279 | <.0001 |
| PS12 | 0.487 | 0.014 | 34.015 | <.0001 |
| Depression | | | | |
| D1 | 0.668 | 0.022 | 30.236 | <.0001 |
| D2 | 0.651 | 0.023 | 28.582 | <.0001 |
| D3 | 0.624 | 0.025 | 25.29 | <.0001 |
| D4 | 0.485 | 0.042 | 11.447 | <.0001 |
| D5 | 0.474 | 0.026 | 18.111 | <.0001 |
| D6 | 0.718 | 0.011 | 65.63 | <.0001 |
| D7 | 0.439 | 0.026 | 17.098 | <.0001 |

*(continued)*

**Appendix B.** (continued)

| | β | *SE* | *z* | *p* |
|---|---|---|---|---|
| Anxiety | | | | |
| A1 | 0.685 | 0.028 | 24.537 | <.0001 |
| A2 | 0.693 | 0.036 | 19.103 | <.0001 |
| A3 | 0.758 | 0.015 | 49.2 | <.0001 |
| A4 | 0.606 | 0.026 | 23.627 | <.0001 |
| A5 | 0.578 | 0.018 | 31.512 | <.0001 |
| A6 | 0.473 | 0.036 | 13.145 | <.0001 |
| A7 | 0.764 | 0.047 | 16.218 | <.0001 |
| Structural coefficients | | | | |
| Anxiety | | | | |
| Age | −0.012 | 0.002 | −5.044 | <.0001 |
| Sex | 0.147 | 0.031 | 4.761 | <.0001 |
| Stress | 0.034 | 0.009 | 3.815 | <.0001 |
| Machiavellianism | −0.337 | 0.205 | −1.641 | .101 |
| Narcissism | −0.188 | 0.068 | −2.762 | .006 |
| Psychopathy | 0.458 | 0.206 | 2.224 | .026 |
| Machiavellianism × stress | 0.067 | 0.043 | 1.548 | .122 |
| Narcissism × stress | −0.024 | 0.026 | −0.914 | .361 |
| Psychopathy × stress | −0.03 | 0.038 | −0.795 | .426 |
| Depression | | | | |
| Age | 0.00 | 0.001 | −0.548 | .584 |
| Sex | 0.02 | 0.023 | 0.853 | .394 |
| Stress | 0.032 | 0.011 | 3.011 | .003 |
| Machiavellianism | 0.161 | 0.264 | 0.608 | .543 |
| Narcissism | −0.352 | 0.017 | −21.159 | <.0001 |
| Psychopathy | 0.249 | 0.142 | 1.754 | .079 |
| Machiavellianism × stress | 0.003 | 0.082 | 0.036 | .971 |
| Narcissism × stress | −0.033 | 0.017 | −1.932 | .053 |
| Psychopathy × stress | 0.015 | 0.046 | 0.331 | .74 |
| Psychosis | | | | |
| Age | −0.016 | 0.008 | −1.964 | .049 |
| Sex | 0.295 | 0.068 | 4.352 | <.0001 |
| Stress | 0.154 | 0.015 | 10.37 | <.0001 |
| Machiavellianism | −2.84 | 1.843 | −1.541 | .123 |
| Narcissism | 0.058 | 0.151 | 0.384 | .701 |
| Psychopathy | 2.276 | 1.189 | 1.913 | .056 |
| Machiavellianism × stress | 0.509 | 0.226 | 2.254 | .024 |
| Narcissism × stress | −0.054 | 0.027 | −1.987 | .047 |
| Psychopathy × stress | −0.261 | 0.181 | −1.445 | .148 |
| Machiavellianism | | | | |
| Age | −0.007 | 0.001 | −9.81 | <.0001 |
| Sex | −0.121 | 0.019 | −6.446 | <.0001 |
| Narcissism | | | | |
| Age | −0.007 | 0.002 | −3.798 | <.0001 |
| Sex | −0.214 | 0.027 | −7.829 | <.0001 |
| Psychopathy | | | | |
| Age | −0.009 | 0.001 | −15.3 | <.0001 |
| Sex | −0.294 | 0.019 | −15.714 | <.0001 |
| Residual covariances | | | | |
| Dark Triat traits | | | | |
| Machiavellianism, narcissism | 0.077 | 0.026 | 2.978 | .003 |
| Machiavellianism, psychosis | 0.137 | 0.023 | 6.086 | <.0001 |
| Narcissism, psychosis | 0.126 | 0.013 | 9.517 | <.0001 |
| Mental distress variables | | | | |
| Anxiety, depression | 0.145 | 0.028 | 5.166 | <.0001 |

*(continued)*

**Appendix B.** (continued)

| | β | *SE* | *z* | *p* |
|---|---|---|---|---|
| Anxiety, psychosis | 0.271 | 0.07 | 3.845 | <.0001 |
| Depression, psychosis | 0.150 | 0.036 | 4.124 | <.0001 |
| Intercepts | | | | |
| M1 | 3.786 | 0.04 | 94.937 | <.0001 |
| M2 | 3.021 | 0.061 | 49.844 | <.0001 |
| M3 | 3.195 | 0.062 | 51.494 | <.0001 |
| M4 | 3.444 | 0.055 | 62.897 | <.0001 |
| M5 | 3.11 | 0.085 | 36.805 | <.0001 |
| M6 | 3.212 | 0.184 | 17.421 | <.0001 |
| M7 | 4.052 | 0.052 | 78.169 | <.0001 |
| M8 | 2.805 | 0.079 | 35.331 | <.0001 |
| M9 | 3.725 | 0.077 | 48.624 | <.0001 |
| N1 | 3.258 | 0.148 | 22.071 | <.0001 |
| N2 | 2.883 | 0.067 | 42.899 | <.0001 |
| N3 | 2.684 | 0.106 | 25.366 | <.0001 |
| N4 | 2.49 | 0.184 | 13.543 | <.0001 |
| N5 | 3.315 | 0.168 | 19.775 | <.0001 |
| N6 | 2.919 | 0.095 | 30.574 | <.0001 |
| N7 | 2.544 | 0.123 | 20.678 | <.0001 |
| N8 | 2.827 | 0.062 | 45.892 | <.0001 |
| N9 | 3.469 | 0.223 | 15.542 | <.0001 |
| P1 | 2.508 | 0.072 | 34.701 | <.0001 |
| P2 | 2.77 | 0.127 | 21.798 | <.0001 |
| P3 | 2.308 | 0.036 | 64.981 | <.0001 |
| P4 | 2.233 | 0.059 | 38.12 | <.0001 |
| P5 | 3.606 | 0.037 | 97.246 | <.0001 |
| P6 | 2.748 | 0.082 | 33.501 | <.0001 |
| P7 | 2.245 | 0.079 | 28.493 | <.0001 |
| P8 | 2.227 | 0.068 | 32.67 | <.0001 |
| P9 | 2.494 | 0.08 | 30.979 | <.0001 |
| A1 | 2.548 | 0.044 | 58.385 | <.0001 |
| A2 | 2.49 | 0.05 | 49.343 | <.0001 |
| A3 | 2.759 | 0.072 | 38.204 | <.0001 |
| A4 | 2.228 | 0.038 | 59.291 | <.0001 |
| A5 | 2.173 | 0.017 | 126.081 | <.0001 |
| A6 | 2.373 | 0.095 | 24.965 | <.0001 |
| A7 | 2.25 | 0.059 | 38.413 | <.0001 |
| D1 | 1.67 | 0.035 | 47.341 | <.0001 |
| D2 | 1.28 | 0.02 | 65.406 | <.0001 |
| D3 | 1.613 | 0.03 | 53.544 | <.0001 |
| D4 | 2.023 | 0.037 | 54.124 | <.0001 |
| D5 | 1.734 | 0.034 | 51.531 | <.0001 |
| D6 | 1.477 | 0.054 | 27.486 | <.0001 |
| D7 | 1.425 | 0.009 | 156.706 | <.0001 |
| Thresholds | | | | |
| PS1 | 0.267 | 0.163 | 1.634 | .102 |
| PS2 | 0.335 | 0.33 | 1.016 | .31 |
| PS3 | 1.867 | 0.286 | 6.517 | <.0001 |
| PS4 | 1.429 | 0.597 | 2.393 | .017 |
| PS5 | 2.383 | 0.148 | 16.062 | <.0001 |
| PS6 | 1.271 | 0.145 | 8.783 | <.0001 |
| PS7 | −0.072 | 0.231 | −0.31 | .757 |
| PS8 | 2.647 | 0.256 | 10.34 | <.0001 |
| PS9 | 0.677 | 0.438 | 1.548 | .122 |
| PS10 | 3.061 | 0.275 | 11.118 | <.0001 |

*(continued)*

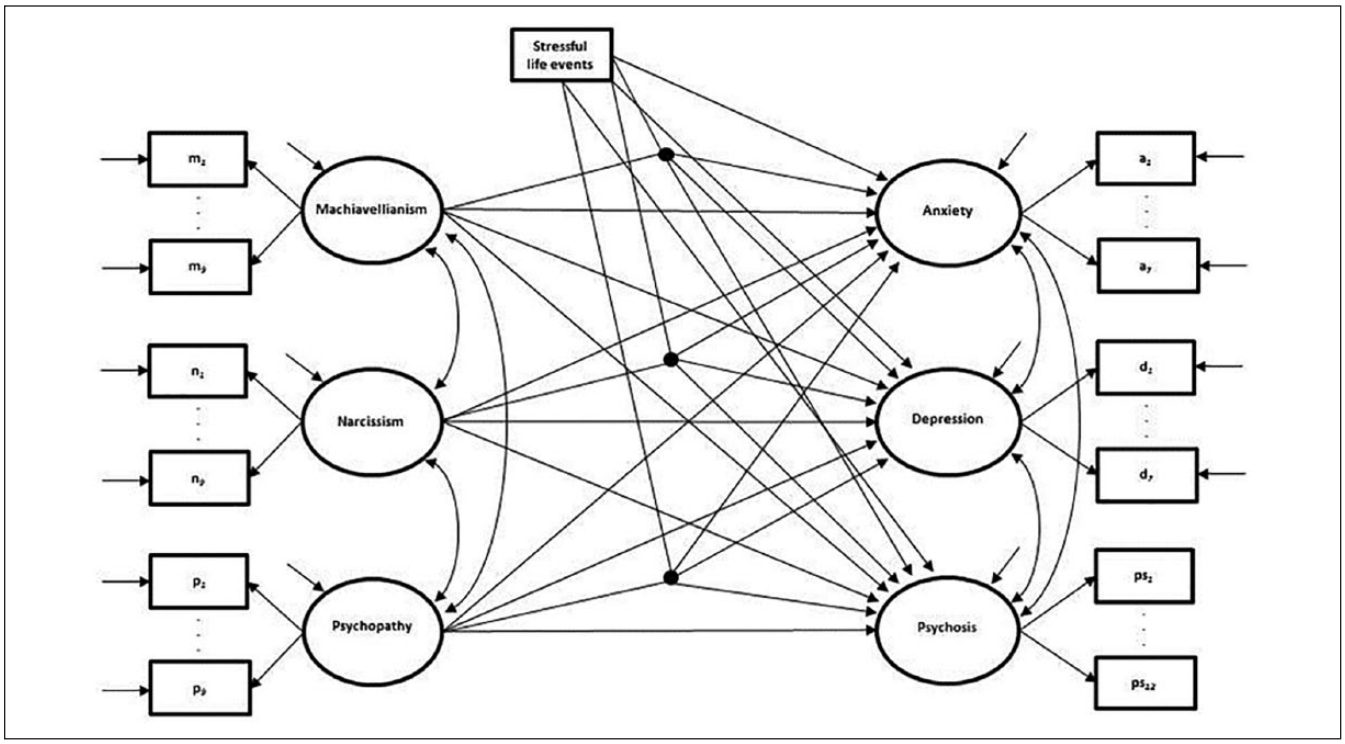
**Appendix B.** (continued)

| | β | *SE* | *z* | *p* |
|---|---|---|---|---|
| PS11 | 0.411 | 0.249 | 1.652 | .099 |
| PS12 | 1.317 | 0.217 | 6.077 | <.0001 |
| Residual variances | | | | |
| M1 | 0.864 | 0.017 | 50.467 | <.0001 |
| M2 | 0.696 | 0.092 | 7.595 | <.0001 |
| M3 | 0.714 | 0.036 | 19.938 | <.0001 |
| M4 | 1.123 | 0.023 | 48.076 | <.0001 |
| M5 | 0.641 | 0.065 | 9.815 | <.0001 |
| M6 | 0.828 | 0.092 | 8.973 | <.0001 |
| M7 | 0.791 | 0.024 | 32.61 | <.0001 |
| M8 | 0.755 | 0.051 | 14.752 | <.0001 |
| M9 | 0.932 | 0.047 | 19.913 | <.0001 |
| N1 | 0.872 | 0.038 | 23.013 | <.0001 |
| N2 | 1.005 | 0.09 | 11.192 | <.0001 |
| N3 | 0.495 | 0.044 | 11.265 | <.0001 |
| N4 | 0.575 | 0.058 | 9.958 | <.0001 |
| N5 | 0.869 | 0.029 | 30.363 | <.0001 |
| N6 | 1.15 | 0.095 | 12.148 | <.0001 |
| N7 | 1.114 | 0.034 | 32.334 | <.0001 |
| N8 | 0.946 | 0.073 | 12.883 | <.0001 |
| N9 | 0.933 | 0.043 | 21.567 | <.0001 |
| P1 | 0.655 | 0.058 | 11.365 | <.0001 |
| P2 | 1.045 | 0.077 | 13.574 | <.0001 |
| P3 | 0.454 | 0.05 | 9.089 | <.0001 |
| P4 | 0.637 | 0.046 | 13.797 | <.0001 |
| P5 | 0.918 | 0.034 | 26.708 | <.0001 |
| P6 | 0.574 | 0.028 | 20.701 | <.0001 |
| P7 | 1.512 | 0.225 | 6.715 | <.0001 |
| P8 | 0.91 | 0.04 | 22.872 | <.0001 |
| P9 | 0.528 | 0.036 | 14.554 | <.0001 |
| A1 | 0.325 | 0.029 | 11.1 | <.0001 |
| A2 | 0.513 | 0.028 | 18.461 | <.0001 |
| A3 | 0.413 | 0.021 | 19.807 | <.0001 |
| A4 | 0.403 | 0.037 | 10.877 | <.0001 |
| A5 | 0.4 | 0.024 | 17.013 | <.0001 |
| A6 | 0.591 | 0.043 | 13.679 | <.0001 |
| A7 | 0.36 | 0.022 | 16.324 | <.0001 |
| D1 | 0.33 | 0.022 | 15.298 | <.0001 |
| D2 | 0.222 | 0.029 | 7.54 | <.0001 |
| D3 | 0.297 | 0.026 | 11.597 | <.0001 |
| D4 | 0.548 | 0.028 | 19.373 | <.0001 |
| D5 | 0.62 | 0.021 | 29.333 | <.0001 |
| D6 | 0.278 | 0.011 | 24.55 | <.0001 |
| D7 | 0.412 | 0.018 | 22.574 | <.0001 |
| Machiavellianism | 0.10 | 0.034 | 2.92 | .003 |
| Narcissism | 0.274 | 0.047 | 5.888 | <.0001 |
| Psychopathy | 0.262 | 0.021 | 12.493 | <.0001 |
| Anxiety | 1.297 | 0.306 | 4.245 | <.0001 |
| Depression | 0.197 | 0.045 | 4.329 | <.0001 |
| Psychosis | 0.239 | 0.041 | 5.778 | <.0001 |

*Note*. The estimates of factor loading represent fully standardized solutions, whereas the structural coefficients are on raw scale. Distributional locations are given as intercepts and thresholds for continuous and discrete indicators, respectively.

## Appendix C

Graphical representation of the structural equation model used to examine the potential moderating influence of Dark Triad traits on how cumulative life stress is associated with mental distress.




*Note.* Unobserved latent factors measuring Dark Triad traits (i.e, narcissism, Machiavellianism, and psychopathy) and the three mental distress variables (i.e., anxiety, depression, and psychosis) are represented as circles. Observed measured variables, that is, the total number of stressful life events and the indicators of latent variables are represented as boxes. Single-headed arrows pointing from latent factors at indicators represent factor loadings, and in structural part of the model, they represent linear path coefficients. Arrows connected with black dots specify estimated interactions between life stress and Dark Triad traits, whereas short arrows pointing at the nondiscrete indicators and latent variables represent their variances or residual variances (i.e., disturbances) if the latents are exogenous. Two-headed arrows represent covariances between the latent variables. The covariates participant sex and age were treated as observed variables and were assumed to directly influence life stress, Dark Triad traits, and the three latent variables of mental distress, but these variables were omitted from the graph to avoid too fuzzy presentation of the estimated associations.

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