



# Not All Individuals Who Encounter Stressful Life Events Experience Mental Distress: The Predictive Ability of Rumination, Neuroticism, Extraversion, Social Support, and Stressful Life Events on Mental Distress

Peter Baker<sup>1</sup> · Mohammad Seydavi<sup>2</sup> · Mehdi Akbari<sup>2</sup> · Marcantonio M. Spada<sup>1</sup> · Daniel C. Kolubinski<sup>1</sup>

Accepted: 19 June 2024

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## Abstract

There is a common belief that experiencing stressful life events can lead to mental distress. However, we wanted to explore whether all individuals who encounter SLEs will also experience mental distress. Also, we were curious to explore the contribution of social and individual characteristics in the prediction of mental distress above or beyond SLEs. The current study investigated if rumination, extraversion, perceived social support, stressful life events, and neuroticism can predict levels of mental distress independently from one another. A sample of 183 university students was recruited, and questionnaires on neuroticism, extraversion, rumination, perceived social support, and stressful life events were completed. A regression analysis was conducted to test whether these variables can predict levels of mental distress. Not all participants who experienced stressful life events would experience mental distress. Also, regression analysis revealed that stressful life events, social support, neuroticism, and rumination all independently predicted levels of mental distress when controlling for age and levels of extraversion. The present study sheds light on how various internal factors, such as neuroticism and rumination, and external factors, such as stressful life events and social support, may and may not contribute to mental distress.

**Keywords** Neuroticism · Mental distress · Rumination · Social support · Stressful events · University students

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✉ Mehdi Akbari  
m.akbari@khu.ac.ir

<sup>1</sup> Division of Psychology, School of Applied Sciences, London South Bank University, London, UK

<sup>2</sup> Department of Clinical Psychology, Faculty of Psychology and Education, Kharazmi University, No.43. South Mofatteh Ave, Tehran, Iran

## Introduction

Mental distress is an emotional state in response to stress characterized by symptoms of depression and anxiety (Barlow et al., 2020). A notable increase in mental distress among the university student population has appeared, with reports of 76% to 83.9% of students experiencing some form of distress that coincides with university attrition (Antaramian, 2014; Bore et al., 2016). These statistics portray an emerging “*mental health crisis*” in third-level education that requires attention to identify the risk factors contributing to mental distress while providing accessible support for this vulnerable portion of the population (Evans et al., 2018). Assari and Lankarani (2015) suggest that the universal experience of stressful life events may be a potential factor that contributes to mental distress.

## Personality

### Neuroticism

Neuroticism is defined as a tendency to perceive the environment as threatening, which heightens the risk of experiencing mental distress symptoms (Slavish et al., 2018; Uliaszek et al., 2010), and this has been demonstrated clearly within populations of university students (Mei et al., 2022; Schmidt et al., 2013). As neuroticism increases the emotional reactivity to stressors, the link between stressful life events [SLE] and distress is more prevalent during early adulthood (Van der Veen et al., 2016). The neuroticism moderation model suggests that high neuroticism levels will serve as a moderator for experiencing distress following significant life events (Spinhoven et al., 2011). Support for this model is mixed as some evidence has reported no moderating effect, while others have found a significant interacting effect with students’ SLEs and a negative affect (Anusic et al., 2014; Schneider et al., 2011). A possible reason for the inconclusive findings may be due to other factors at play, like rumination, which can have significant implications given that both possess similar attributes to appraise events as stressful, leading to maladaptive coping strategies (Gunthert et al., 1999; Verschoor & Markus, 2011).

Previous research (Lu et al., 2017; Muris et al., 2005) has found that the neuroticism and depression link is mediated by rumination among healthy young adults. However, Geurts and Sonnentag (2006) present an alternative viewpoint: neuroticism may moderate rumination’s effect on distress when faced with SLEs. Hamesch and colleagues (2014) conducted a moderated mediation analysis. They reported that the effect rumination states had on work-related stressors and mental health among dental students was conditionally influenced by only low levels of neuroticism. This is an interesting finding, as existing studies have emphasized high levels of neuroticism being linked with rumination (Gunthert et al., 1999). Further exploration of the relationship between neuroticism and distress is required as it may influence the interaction of the neuroticism personality trait.

In the current study, we aimed to examine the contribution of neuroticism in explaining mental distress scores. Given the reviewed literature above, we sought to

determine whether neuroticism could predict mental distress beyond rumination and SLEs.

## Extraversion

Extroversion is a personality trait that has demonstrated strong correlations with mental health outcomes (Smillie, 2018). Individuals with high extroversion scores tend to experience greater levels of positive emotions, activity, assertiveness, a need for stimulation, and sociability compared to those with low extroversion scores (McCabe & Fleeson, 2012). Hakulinen and colleagues (2015) conducted a meta-analysis that demonstrated that lower levels of extraversion were negatively associated with depressive symptoms in both cross-sectional and longitudinal studies, although this effect was not as strong as that for neuroticism. In the current study, we also aimed to examine the contribution of extraversion in explaining mental distress scores. Given the reviewed literature above, it was of interest to see whether extraversion can predict mental distress beyond neuroticism.

## Rumination

Nolen-Hoeksema's (1991) Ruminative Response Style Theory [RSST] explains rumination as an emotion-focused coping strategy towards negative distress which involves self-reflection of the causes and consequences of the stressor without the engagement of problem-solving (Nolen-Hoeksema et al., 2008). Although rumination can be categorized into the specific response styles of brooding and reflection, rumination as a unitary construct is recognized as playing a reciprocal with mental distress and internalizing psychopathology (Marroquín et al., 2010; McLaughlin & Nolen-Hoeksema, 2011), including in populations of university students (Morrison & O'Connor, 2005).

Expanding upon the RSST, the Stress-Reactive Model of Rumination postulates that rumination serves as a stress trigger following SLEs, which maintains distress symptoms in everyday life (Alloy et al., 2000). Moberly and Watkins (2008) provide supporting evidence for the model, who reported that rumination partially contributed to negative affect because of a reduced capacity to disengage from stressful information. While rumination is commonly utilized as a method for self-regulation and the modulation of one's affective experiences, it may prove to be counterproductive, resulting in heightened challenges in emotion regulation (see Mansueto et al., 2022, 2024; Palmieri et al., 2023).

University students experience a spectrum of SLEs ranging from academic assessments to financial difficulties, which increases the likelihood of ruminating and experiencing distress due to not reaching full emotional maturity (Kim & You, 2019; Mikolajczyk et al., 2008). Wang and colleagues (2020) support this claim as they found that high levels of rumination mediated the role of adverse life events leading to distress and suicidal ideation among Chinese university students. However, Turner and McLaren (2011) provide contradictory evidence, highlighting that not all individuals engaging in rumination will result in adverse mental health

outcomes. This provides a gap in the literature to investigate whether rumination can predict levels of distress when controlling for SLEs and other environmental factors, such as one's social support network.

### **Stressful Life Events**

Stressful Life Events [SLE] are adverse or undesired events that can impact one's mental state due to the event being threatening or the individual lacking the coping skills to manage the situation (Allam, 2011; Lebois et al., 2016). The Stressful Events Model suggests that exposure to SLEs over time increases the likelihood of experiencing distress, with studies supporting this theory (Han et al., 2017; Thoits, 2010). SLEs have been associated with a wide range of mental disorders, such as depression, anxiety, obsessive–compulsive disorders, eating disorders, and psychosis (Lie et al., 2021; Mansueto & Faravelli, 2023; Tennant et al., 2002; Murayama et al., 2020; Juruena et al., 2020), this is also true in populations of university students (Morrison & O'Connor, 2005; Schmidt et al., 2013). However, the implication of multiple SLEs elevating the risk of experiencing mental distress among university students is mixed, as some individuals demonstrate resiliency while others have difficulties coping due to personal vulnerabilities and the environment (Yilidiz, 2020).

Lazarus and Folkman's (1987) Transactional Theory of Stress and Coping [TTSC] addressed this issue by incorporating the cognitive underpinnings attributed to stress, detailing how the individual's appraisal processes towards the stressor may impact the person's coping strategies resulting in mental distress experiences (Martin & Daniels, 2014). Wrench and colleagues (2014) reported that academic assessment demands and geographical relocation were appraised as being the primary SLEs that impacted first-year university student's well-being, resulting in a decline in academic performance.

In the current study, we aimed to examine whether all individuals with SLEs would also experience mental distress. Furthermore, given the reviewed literature above, it was deemed of interest to examine whether SLEs can predict mental distress beyond all predictors included in the study.

### **Social Support**

Social support is the perception or action of receiving available support from social connections or community members (Skomorovsky, 2014), which has been shown to have a negative association with depression, anxiety, and stress in a population of university students (Bukhari & Afzal, 2017). According to Cohen and McKay's (1987) Stress-Buffering Hypothesis, social support plays a significant role in predicting mental distress by acting as an obstacle for the individual against the negative consequences of SLEs.

Studies have reported that perceived social support has strong positive moderating effects on emerging adults' mental health following exposure to stress (Melorse et al., 2015; Pettit et al., 2011). Miloseva and colleagues (2017) found that high levels of

perceived support moderated the association between adverse events and distress. Similarly, Swickert et al. (2002) demonstrated that social support might mediate the relationship between extraversion and stress. However, Ioannou and colleagues (2019) provide an alternative perspective, suggesting that high levels of perceived support can be associated with increased distress due to the perception of being unable to take care of one's circumstances.

Contemporary literature is unclear in determining whether perceived social support may moderate the distress outcome among young adults. Nonetheless, there is evidence that posits that social support can play a role in mitigating the effects of physical health problems for those with high levels of neuroticism (Park et al., 2013). Furthermore, low rumination and social support can benefit mental health (Flynn et al., 2010). Vélez and colleagues (2016) found a non-significant moderating effect of perceived support on distress when high rumination levels were present. In comparison, individuals with higher levels of social support were reported to invest less into the consequences of a stressor, which buffered the impact rumination can have on SLEs and negative affect (Puterman et al., 2010). Nonetheless, these studies do not address whether perceived social support can predict levels of mental distress when controlling for levels of neuroticism and rumination. Given the reviewed literature above, we wished to examine the contribution of social support in explaining mental distress scores. Furthermore, it was deemed of interest to examine whether social support could predict mental distress beyond SLEs.

## **Aims and Hypotheses**

The current study aims to enhance the literature on the intricacies of the relationship between various internal and external factors and mental distress by considering the role of cognitive, personal, circumstantial, and social characteristics. This study hypothesizes that neuroticism, rumination, and SLEs would positively predict mental distress symptoms among university students, while social support and extraversion will negatively predict distress when controlling for the other variables.

## **Methodology**

### **Participants**

A convenience sample of 183 university students (140 females; Mean age=25 years [SD=6.99; range 18–66 years] completed five online questionnaires in 2021. Once non-completers and outliers were removed. Participants must be (1) at least 18 years of age and (2) attending a university. Participation was voluntary, and participants were assured of confidentiality in this study.

## Measurements

### Mental Distress

The short version of the Depression Anxiety and Stress Scale (DASS-21; Antony et al., 1998) is a 21-item measure that was designed as an instrument to measure symptoms of psychopathology (Lovibond & Lovibond, 1995). The DASS-21 has been shown to have good psychometric and clinimetric properties. (see Mansueto et al., 2023; Lee et al., 2019). The questionnaire uses a 4-point Likert response ranging from “Did not apply to me at all” to “Applied to me most of the time”. The DASS-21 contains a bi-factor structure (Henry & Crawford, 2005), which includes an overall factor for psychological distress in addition to three sub-scales: depression (“I could not seem to experience any positive feeling at all”), anxiety (“I was aware of dryness of my mouth”) and stress (“I found it hard to wind down”). Normal scores of distress range from 0 to 30, while moderate to severe forms of distress scored above 31 and 61, respectively. This study reported a Cronbach alpha value of  $\alpha = 0.92$  for mental distress.

### Rumination

The short version of the Ruminative Response Scale (RRS-10; Treynor et al., 2003) is a 10-item measure based on Nolen-Hoeksema and Marrow’s (1991) original 22-item measure. The RRS-10 requires participants to answer questions based on experiences where they felt down, sad, or depressed using a 4-point Likert scale ranging from Never to Always (“Think ‘What am I doing to deserve this?’”). The RRS-10 contains an overall scale for rumination and is split into two sub-scales: Brooding and Reflection, each containing five items. The scoring ranges from 10 to 40, with the higher scores highlighting increased ruminative symptoms. The RRS-10 has demonstrated good reliability and correlated strongly to the original version of the scale (Erdur-Baker & Bugay, 2010; Thanoi & Klainin-Yobas, 2015). This study reported an excellent Cronbach Alpha value for the RRS-10 ( $\alpha = 0.84$ ).

### Stressful Life Events

The Social Readjustment Rating Scale (SRSS; Holmes & Rahe, 1967) consists of 43 items that measure the most common life stressors. Participants are required to respond “Yes” or “No” for each event to indicate if that particular event had occurred in the past year. Participants who respond “Yes” to each event are scored depending on the severity of the stressful event. Ratings range from 100 (“Death of a Spouse”), which requires the most adjustment, to 11 (“Minor violations of the law”), which requires the least adjustment. A score of  $\leq 150$  indicates low levels of stress and suggests a lower probability of developing stress-related disorders. Severe levels of stress score  $\geq 300$ , which increases the likelihood of developing an illness by 80%

within the next 2 years (Holmes & Rahe, 1967). This study found a Cronbach Alpha value of  $\alpha=0.73$  for the SSRS scale.

### Perceived Social Support

The Multidimensional Scale of Perceived Social Support (MPSS; Zimet et al., 1988) assesses the perceived social support available for an individual and is widely used in clinical and non-clinical samples (Akbari et al., 2022; Ege et al., 2008; Zimet et al., 1990) and has demonstrated good psychometric properties. This measure contains 12 items and uses a 7-point Likert scale ranging from “Strongly Disagree” to “Strongly Agree.” Items include “There is a special person who is around when I am in need” and “My family really tries to help me.” Scoring is determined by the higher the score, which signifies that more social support is available, with the cumulative score ranging from 12 to 84 (Dahlem et al., 1991). The total score is calculated by adding the ratings and dividing by 12. This study reported a Cronbach Alpha value of  $\alpha=0.90$  for the total scale.

### Personality

The Brief Version of the Eysenck Personality Questionnaire (EPQ-BV; Sato, 2005) is a revised version of the existing Eysenck Personality Questionnaire Revised-Short scale to measure specific personality traits within Eysenck’s (1967) biological model of personality. This measure contains 24 items, and participants are asked questions regarding how they behave, feel, and act using a 5-point Likert scale ranging from Not at All to Extremely. The EPQ-BV consists of two sub-scales: extraversion and neuroticism. The Neuroticism sub-scale investigates the participant’s emotional and physical reactions, which are often irrational and negative (“Are your feelings easily hurt?”, “Would you call yourself a nervous person?”). The extraversion subscale consists of questions such as “Are you a talkative person?” and “Do you enjoy meeting other people.” Sato (2005) reported excellent test–retest reliability ( $r=0.92$  and  $0.91$ , respectively). This study found an excellent Cronbach Alpha value for Neuroticism ( $\alpha=0.91$ ) and Extraversion ( $\alpha=0.90$ ).

### Procedure

This study received ethical approval from the Division of Psychology Research Ethics Committee at London South Bank University, United Kingdom. All procedures conducted were in accordance with the British Psychological Society’s ethical guidance and the university’s policy for research involving human participants. Participants were recruited via the Internet by posting a hyperlink of the study on Facebook and Survey Circle targeting university students. The study was advertised at London South Bank University through its internal Research Participation Scheme, where students can volunteer to participate in research studies in exchange for credits. The hyperlink directed potential participants to the study’s website, which contained the questionnaires required for the study.

## Data Analysis

Statistical analysis was conducted using Jamovi (version 2.3.18). Before running regression analyses, the underlying assumptions of hierarchical regression were checked. The Durbin-Watson (DW) test was used to check the presence of autocorrelation in the data set, but the results (autocorrelation =  $-0.01$ ,  $DW=2$ ,  $p=0.912$ ) indicated that this assumption is met. The absence of multicollinearity was also tested using the variance inflation factor (VIF) and its corresponding tolerance value. The VIF ranged from 1.07 to 2.14, and the tolerance value ranged from 0.48 to 0.93; given that the VIF is less than ten and the tolerance value is above 0.25, there is no sign of multicollinearity.

Moreover, the absence of influential outliers was checked using Cook's distance; this index's mean and standard deviation were 0.00641 and 0.0188, respectively. Given that this value was below 0.50, thus there is no evidence of influential outliers. Normality was also tested using the Kolmogorov–Smirnov test, and given the insignificant  $p$ -values ( $>0.05$ ), the assumption of normal distribution was also met. The absence of heteroskedasticity was examined using the Goldfeld-Quandt test, and given the insignificant  $p$ -value ( $>0.05$ ), this assumption was also met. Homoscedasticity was examined visually by a Q-Q plot of residuals, and the data appears homoscedastic. The last assumption, linear fit (null residual), was examined by plotting residuals to the fitted value, and this assumption was also met.

## Results

Mental distress was negatively related to social support and extraversion but positively related to stressful life events, neuroticism, brooding, and reflection. However, neuroticism and stressful life events were significantly and positively associated with brooding and reflection. Reflection, neuroticism, and distressful life events were not correlated with social support; however, brooding and extraversion were negatively and positively associated with social support, respectively.

As seen in Table 1, the total sample's average score for stressful life events is 222.34, which is in the moderate range; however, curiously, their average score for mental distress is in the normal range. Also, we did this analysis based on the cut-off points of stressful life events. As such, 38 individuals scored 150 or lower on SLE, and their mean score on mental distress was 14.26 ( $SD=7.24$ ). Also, 69 individuals scored 300 or higher on SLE, and their mean score on mental distress was 20.85 ( $SD=11.64$ ). Also, 76 individuals scored between 151 and 299 on SLE, and their mean score on mental distress was 19.10 ( $SD=11.48$ ).

Accordingly, despite the level of SLE (low, moderate, or severe), the mental distress was in the normal range (below 30). Given the positive association between mental distress and stressful life events in this sample and the participant's mean scores, it is possible that not all participants who experienced stressful life events would also experience mental distress.



**Table 1** Mean, standard deviation, and correlations between variables

	M	SD	Mental distress	Social support	Stressful life events	Extraversion	Neuroticism	Brooding	Reflection
Mental distress	8.02	4.91	–						
Social support	58.15	11.64	–0.26***	–					
Stressful life events	222.34	99.25	0.21**	–0.05	–				
Extraversion	39.70	8.62	–0.18*	0.30***	0.08	–			
Neuroticism	28.06	8.25	0.67***	–0.14	0.05	–0.20**	–		
Brooding	7.28	1.41	0.58***	–0.18*	0.16*	–0.04	0.47***	–	
Reflection	8.21	2.09	0.58***	–0.13	0.17*	–0.13	0.44***	0.69***	–

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

## Regression Analysis

As seen in Table 1, social support and extraversion were negatively and significantly associated with mental distress. At the same time, stressful life events, neuroticism, and rumination (brooding and reflection) were positively and significantly associated with mental distress. Also, age was negatively and significantly associated with mental distress, while it was non-significant for gender. To avoid pseudo-variance, only variables with a significant correlation with mental distress were added to the model as independent variables to predict mental distress as the dependent variable. To explore the contribution of each predictor in explaining variance in mental distress score, we have run a hierarchical regression analysis using the enter method. Table 2 presents the results for predicting mental distress scores from age [step 1], stressful life events and social support [step 2], neuroticism and extraversion [step 3], and brooding and reflection [step 4]. The results indicated that age significantly predicted mental distress,  $F(1, 181) = 5.93$ ,  $p < 0.01$ , explaining a 0.03% variance and model fit measures were  $AIC = 1397$ ,  $BIC = 1407$ , and  $RMSE = 10.82$ . The addition of stressful life events and social support (step 2) resulted in a significant regression equation,  $F(3, 179) = 11.70$ ,  $p < 0.001$ , explaining an extra 13.2% of the variation in mental distress, which was significant ( $\Delta F(2, 179) = 14.2$ ,  $p = 0.01$ ), the model fit measures were  $AIC = 1374$ ,  $BIC = 1390$ , and  $RMSE = 10.06$ .

**Table 2** Hierarchical regression model using enter method for predicting mental distress

Predictor	$\beta$ [UL, LI]	$T$	$R$	$R^2$	Adjusted $R^2$	$\Delta R^2$
<i>Step 1</i>						
Age	-0.17* [-0.32, -0.03]	-2.43	0.17	0.03	0.02	0.03*
<i>Step 2</i>						
Age	-0.23* [-0.37, -0.10]	-3.45	0.40	0.16	0.14	0.13*
Stressful life events	0.22* [0.08, 0.35]	3.20				
Social support	-0.28* [-0.42, -0.14]	-4.13				
<i>Step 3</i>						
Age	-0.05 [-0.16, 0.05]	-1.02	0.71	0.50	0.49	0.34*
Stressful life events	0.17* [0.07, 0.28]	3.29				
Social support	-0.16* [-0.27, -0.05]	-2.92				
Neuroticism	0.61* [0.50, 0.72]	10.85				
Extraversion	-0.02 [-0.13, 0.08]	-0.41				
<i>Step 4</i>						
Age	-0.02 [-0.13, 0.07]	-0.57	0.77	0.60	0.58	0.09*
Stressful life events	0.11* [0.02, 0.21]	2.40				
Social support	-0.12* [-0.22, -0.02]	-2.42				
Neuroticism	0.45* [0.34, 0.56]	7.89				
Extraversion	-0.02 [-0.12, 0.07]	-0.50				
Brooding	0.16* [0.03, 0.30]	2.40				
Reflection	0.22* [0.08, 0.35]	3.27				

\* $p < 0.05$

and the effect-size for the addition of step 2 was Cohen's  $f^2=0.15$ . The inclusion of neuroticism and extraversion (step 3) produced a significant equation,  $F(5, 177)=36.58$ ,  $p<0.001$ , accounting for an additional 34% of the variation explained in mental distress scores, which was significant ( $\Delta F(2, 177)=62$ ,  $p=0.01$ ), the model fit measures were  $AIC=1281$ ,  $BIC=1304$ , and  $RMSE=7.71$ , and the effect-size for the addition of step 3 was Cohen's  $f^2=0.68$ . Finally, the addition of the brooding and reflection (step 4) resulted in a significant equation,  $F(7, 175)=37.76$ ,  $p<0.001$ , accounting for an additional 0.09% of the variation in mental distress scores, which was also significant ( $\Delta F(2, 175)=20.5$ ,  $p=0.01$ ), the model fit measures were  $AIC=1247$ ,  $BIC=1275$ , and  $RMSE=6.94$ , and the effect-size for the addition of step 4 was Cohen's  $f^2=0.25$ .

The final model (step 4) had superior fit metrics (lower AIC, BIC, and RMSE) than earlier models (steps 1, 2, and 3) and predicted a 58% variance in mental distress scores. According to Cohen's  $f^2$ , the order of variables by their importance in predicting mental distress were neuroticism, reflection, brooding, social support, and stressful life events, respectively. When the model was adjusted for the other factors, age, and extraversion were not significant predictors of mental distress in the final model. Finally, neuroticism surpassed all other variables in predicting mental distress; only social support predicted mental distress negatively, whereas all other variables predicted mental distress positively.

## Discussion

The primary aim of the study was to investigate if various cognitive, personality, and environmental factors contribute to mental distress. This study found evidence to support the hypotheses outlined at the outset. Firstly, as seen in previous research (Nolen-Hoeksema et al., 2008), both subsets of rumination, brooding, and reflection were independent predictors of mental distress when controlling for the other variables (age, SLEs, social support network, neuroticism, and extraversion).

Furthermore, neuroticism was also an independent predictor of mental distress when controlling for the other variables. In the current study, it was interesting to examine whether neuroticism would predict mental distress beyond rumination and SLEs. We also found that neuroticism outperformed all variables in the model, including rumination and SLEs. Based on Lazarus and Folkman's (1987) Transactional Stress and Coping Theory, given that individuals with high neuroticism are more likely to appraise the world as threatening and struggle to deal with stressors, these students may employ emotion-focused methods like rumination, where they dwell on the event without problem-solving (Lahey, 2009; Pasyugina et al., 2014). As a result, this maladaptive strategy contributes to mental distress symptoms. Overall, this study highlights how internal cognitive and personality factors may contribute to mental distress. Future research may wish to explore whether the tendency to ruminate may moderate the relationship between neuroticism and mental distress.

Further, we sought to examine the contribution of extraversion in explaining mental distress scores and to see whether extraversion could predict mental

distress beyond neuroticism. However, though we found that extraversion was associated with mental distress, it was at a non-significant level. This finding contradicts the meta-analytic findings of Hakulinen and colleagues (2015), who demonstrated that lower levels of extraversion were negatively associated with depressive symptoms in both cross-sectional and longitudinal studies. However, the outperforming of all variables by neuroticism was aligned with the finding of the mentioned meta-analysis i.e., the effect of extraversion was not as strong as that of neuroticism. It seems that neuroticism is much more important in predicting mental distress scores than the tendency to be extroverted, sociable, lively, and active.

For this study, it was also hypothesized that Stressful Life Events (SLEs) would also independently predict levels of mental distress, and it was interesting to examine whether all individuals with SLEs would also experience mental distress. This analysis supported the hypothesis, which aligns with previous research (Han et al., 2017; Thoits, 2010). The regression analysis indicated a positive relationship between SLEs and mental distress, which coincides with previous studies that reported that SLEs are an important predictor for mental distress (Goldstein et al., 2020; Kendler et al., 1999; Sokratous et al., 2013). However, it is also important to note that individuals who scored in the high range of SLEs were still in the typical range of mental distress, meaning that not all individuals who experience stressful life events experience high levels of emotional distress, which could highlight the level of resiliency in this population (Pidgeon et al., 2014).

The Stress-Reactive Model of Rumination states that the experience of stressful events leads to the engagement of rumination as a method of adaptation (Alloy et al., 2000; Smith & Alloy, 2009), yet both constructs were independent predictors of mental distress in this study. According to Zhang (2017), university students experience a developmental transition that makes them more susceptible to negative mental health consequences following SLEs. There is evidence to support the interactional effects between neuroticism and stressful life events on subsequent levels of depression (Vinkers et al., 2014), and future research may wish to explore this relationship in greater detail.

Lastly, it was interesting to examine the contribution of social support to explaining mental distress scores and whether social support could predict mental distress beyond SLEs. Regarding the effects of perceived social support, the analysis indicated that it also served to predict levels of mental distress independently, but the direction of prediction was different, as social network support negatively, and SLEs positively, predicted mental distress. However, both tied up together in explaining mental distress scores. This result contradicts the findings of Borja and colleagues (2009), who found that social support did not independently predict levels of general distress. However, they found that it did interact with levels of neuroticism for individuals who experienced at least one traumatic stressor in their lives. Future research may explore the interaction between these variables further to understand how they interact.

## Implications of Our Findings

The research has several important implications. Firstly, this study extends to the supporting literature that environmental, cognitive, and personality characteristics are crucial antecedents for mental distress. Therefore, it is suggested that universities should develop prevention programs to help students manage stressful events throughout their courses, given that stressful events, such as financial difficulties or relocation, are significant predictors of experiencing mental distress. (Deasy et al., 2016). Secondly, this study enhances the theoretical understanding of Nolen-Hoeksema's (1991) RRSST by highlighting the importance of cognitive mechanisms attributed to distress. However, it did not explore how these variables might influence one another, which could help develop interventions aimed at helping students who experience any of the internal or external factors. For example, identifying the cognitive mechanisms linked to neuroticism could underlie the implementation of tailored treatment strategies for students, given that high neuroticism levels can hinder therapeutic outcomes (Bucher et al., 2019). Therapeutic approaches that incorporate emotion regulation skills have shown effective results in promoting mental health and reducing rumination among university students (Butler et al., 2006; Querstret & Copley, 2013). Therapies that directly target levels of rumination, such as Metacognitive Therapy (Wells, 2009), could be helpful when faced with SLEs.

The non-significant effect of extraversion on mental distress, but the significant effect of social network support suggests that being an extrovert (the tendency to experience positive emotions, activity, assertiveness, a need for stimulation, and sociability compared to those with low extroversion scores; McCabe & Fleeson, 2012) may not be as important as receiving social support. It is imperative to note, however, that the common belief is that extroverted people also have good social support. However, our findings indicate that this may not be the case in all situations, as being sociable and being active would not protect against mental distress, but social network support can.

Furthermore our findings that not all individuals who experienced SLEs would also experience mental distress have an important implication that this association may not be direct, and further studies are required to examine the underlying factors. This is in line with the study of Wijnbenga and colleagues (2022), who found that trajectories of low, middle, or high levels of SLEs are not significantly associated with changes in mental health from childhood to young adulthood. Thus, further studies on the role of SLEs on mental distress are required.

## Limitations

The current research has several limitations that need to be acknowledged when interpreting the study results. Firstly, the relationship between the variables was explored using a cross-sectional design, which limits the causal inferences made on the relationship. Second, the data collected for this study relied on

self-reported questionnaires, where social desirability responses may have impacted the results reported. Third, the composition of the demographic sample in the study was skewed, with 76.5% of the sample reported as female. Further research will be required to determine whether these findings can be accurately attributed to the male population. Fourth, the study recruited a convenience sample of university students, mainly from the UK and Ireland, which limits the generalizability of the findings to strictly the university student population in those countries. Fifth, the study's investigation of personality traits was strictly limited to neuroticism and extraversion. Existing literature has also examined the impact the personality traits of agreeableness can have on mental distress with interesting findings. For example, Yap and colleagues (2012) found that agreeableness is important when experiencing stressful events involving other people. Therefore, it is worthy to examine the effects these traits can have on mental distress relationships in future research. Sixth, the study did not explore the impact of recent dependent and independent life events, which could have varying roles on the development and continuity of psychological disorders (see Mansueto & Faravelli, 2022; Paykel, 1982, 2001). Seventh, the role of childhood adversities was not explored; however, it may moderate the association between stressful life events that occur in adulthood and psychological disorders (see Mansueto & Faravelli, 2017, 2022; McLaughlin and Nolen-Hoeksema, 2011; Wang et al., 2022). The final limitation to consider is that the data collection was during the COVID-19 pandemic period in the UK, and this may have inflated the variances observed (for a comprehensive review, please see the global psychological effect of COVID-19 anxiety syndrome; Akbari et al., 2023); thus, we suggest replicating the current study in other countries, different cultures, and backgrounds using a longitudinal design to ensure temporality of the findings.

## Conclusion

Despite these limitations, the current study offers theoretical insight into the predictive nature of various cognitive, personal, and social characteristics and mental distress among university students. The results clearly show that rumination, neuroticism, stressful life events, and social support are all independent predictors of mental distress. However, not all individuals who encounter stressful life events experience mental distress. The current study's findings need to be acknowledged when implementing tailored treatment strategies for targeting mental distress.

**Data Availability** The datasets analyzed during the current study are available from the corresponding author upon request.

## Declarations

**Conflict of interest** The authors do not have any conflict of interest to declare.

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