Research article

Distinguishing between trait emotional intelligence and the five-factor model of personality: additive predictive validity of emotional intelligence for negative emotional states

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ABSTRACT

There is ongoing debate on the utility of trait emotional intelligence and whether it is distinguishable from the five-factor model of personality. In study 1, we investigated the incremental validity of trait emotional intelligence in predicting negative emotional states, after controlling for the five-factor model personality traits. The TEIQue, Mini-IPIP, and DASS-21 were administered to a community based Australian sample. Three significant predictive models emerged: (1) wellbeing, and neuroticism predicting depression; (2) emotionality, and neuroticism predicting anxiety; and (3) self-control, and neuroticism predicting stress. In Study 2, we further explored the relationship between TEIQue domains, neuroticism, and negative emotional states. Three partial mediation models were found: (1) wellbeing mediated the relationship between neuroticism and depression; (2) emotionality mediated the relationship between neuroticism and anxiety; and (3) self-control mediated the relationship between neuroticism and stress. The findings highlight that trait emotional intelligence is related to, and yet distinct from extraversion, conscientiousness, agreeableness, neuroticism, and openness. They also provide support for the incremental validity of the TEIQue domains in predicting depression, anxiety, and stress, beyond the five-factor model personality traits in a community based Australian sample, with the domains of trait emotional intelligence potentially operating as protective factors from pervasive negative moods.

1. Introduction

The concept of emotional intelligence (EI) coined by Salovey and Mayer (1990) refers to the ability to perceive, express, and regulate one's own emotions, and understand the emotions of others. EI has been operationalised as both an "ability" based model, and a "trait" based model. Interestingly, the two perspectives of EI are found to weakly correlate (Ferguson and Austin, 2010; Qualter et al., 2012) and show different patterns of associations with other cognitive constructs (e.g., personality, Dimitrijević et al., 2018; theory of mind, Ferguson and Austin, 2010; intelligence, Karim and Shah, 2014; academic ability, Qualter et al., 2012).

Recognising the interaction between emotions and cognition, ability EI refers to cognitive abilities involved in the perception, management, and understanding of emotions (Mayer et al., 2002). Ability EI is commonly measured through ability-based tests, such as the Mayer-Salovey-Caruso Emotional Intelligence Test, designed to mirror the assessment of intelligence (Petrides and Furnham, 2000) and

subsequently has been found to show a significant relationship with other ability-based cognitive constructs such as IQ (Iliescu et al., 2013). Critics of ability EI question whether the constructs measures knowledge of emotions rather than abilities pertaining to emotional management and understanding (Brody, 2004). Further contention arises from ability EI tests identifying objectively "correct" responses from emotional dilemmas which by their very nature are highly subjective (Fiori et al., 2014).

Contrastingly, trait EI is defined as a set of stable characteristics relating to how an individual experiences, expresses, and understands emotions (Petrides and Furnham, 2000). Petrides and Furnham (2001) theorised that trait EI comprises of 15 interrelated facets which can be divided into four domains: wellbeing, emotionality, sociability, and self-control, as assessed using the Trait Emotional Intelligence Questionnaire (TEQUIE). Whilst several alternative theories of Trait EI exist, each with its own set of different domains (Bar-On, 1996; Schutte et al., 1998), the TEIQue is amongst the most commonly used measure of Trait EI, and has been cited in more than 2,000 articles. It was recently

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endorsed to researchers and practitioners in a critical review as "a very good, comprehensive measure of trait EI" (O'Connor et al., 2019, p. 5).

Trait EI is commonly assessed using self-report measures and, similar to ability EI, is not without limitations. The various conflicting conceptualisations of trait EI has led some to suggest that the construct is poorly defined, and simply represents an amalgamation of existing personality constructs (e.g., self-esteem, empathy; Waterhouse, 2006). Subsequently, trait-based EI models have drawn considerable criticism and scepticism due to lack of psychometric robustness (Brody, 2004). Trait EI measures have been found to produce results that too closely resemble those obtained using well established personality self-report measures, such as the five factor model of personality (FFM, i.e., extraversion, neuroticism, openness, agreeableness, and conscientiousness; Dimitrijević et al., 2018; Parker et al., 2011).

Research has repeatedly shown significant high correlations between trait EI as measured using the TEIQue, with the FFM. Siegling et al. (2015b) showed across numerous samples and measures of the FFM, neuroticism, extraversion, openness, agreeableness, and conscientiousness, were significantly associated with global trait EI. Recent studies continue to highlight that TEIQue scores are correlated strongly with neuroticism, and moderately correlated with the remaining FFM personality traits (Dimitrijević et al., 2018; Hjalmarsson and Dåderman, 2020; Pérez-González and Sanchez-Ruiz, 2014). A clear pattern has emerged across several studies showing that trait EI demonstrates significant, moderate-to-strong correlations with each of the personality traits from the FFM (Arteche et al., 2008; de Haro García and Costa, 2014; Gannon and Ranzijn, 2005; Prentice and King, 2013; Saklofske et al., 2007). Specifically, agreeableness, conscientiousness, extraversion, and openness have been positively related to trait EI, while neuroticism has been negatively associated. Researchers theorise that the strong negative correlation between trait EI and neuroticism indicates that trait EI may simply represent the inverse, or absence, of neuroticism (i.e., emotional stability; Alegre et al., 2019). Similarly, Gannon and Ranzijn (2005) used hierarchical regression and reported a significant overlap between personality and trait EI. The FFM accounted for 34.2% of variance in life satisfaction with trait EI accounting for an extra 1.3%. When the variables were entered in the reverse order, trait EI accounted for 28.3% of the variance with the FFM accounting for an additional 8.8 % (Gannon and Ranzijn, 2005).

Crucially, not all research has failed to distinguish between the FFM and trait EI. Previous research has demonstrated construct validity for trait EI as measured by the TEIQue using exploratory factor analysis, reporting that trait EI emerged as a separate factor to the FFM (which emerged as the expected five factors; Petrides et al., 2007b). Furthermore, trait EI has been shown to be a significant predictor of wellbeing, psychological health, and negative affect (O'Connor et al., 2019). Trait emotional intelligence has also shown incremental validity, predicting depression after controlling for the FFM (Petrides et al., 2007a). Likewise, Siegling et al. (2015a) showed trait emotional intelligence accounted for additional unexplained variance in depression, anxiety, and stress after accounting for the FFM. Providing support for the clinical utility of the TEIQue, it has been suggested that trait EI may be conceptualised as a higher-order personality construct that is largely, but not fully explained by the FFM, with covariance ranging from 28% to 53% (Arteche et al., 2008). A review outlined that across eight studies investigating incremental validity of the TEIQue, trait emotional intelligence accounts for an additional 1–18% of variance, in psychological constructs (i.e., wellbeing, negative moods, etc., Siegling et al., 2015a).

Lastly, a meta-analysis of 24 articles investigating the incremental validity of the TEIQue found that, after controlling for various constructs, the TEIQue added variance explained for a variety of emotional (i.e., depression, anxiety, stress) and behavioural factors (i.e., coping strategies, amotivation, life satisfaction; Andrei et al., 2016). However, the authors recognised the need for further research utilising larger, non-student based samples and to examine the utility of the 15 interrelated facets and four domains of the TEIQue, rather than just the global EI

which is frequently exclusively examined in previous research (Pérez-González and Sanchez-Ruiz, 2014; Siegling et al., 2015a). By restricting their focus to investigating global TEIQue scores it is difficult to determine which aspects of emotional intelligence are most important for promoting positive life outcomes. Only five of the 24 studies reported significant incremental contribution of the TEIQue domains, with the remaining studies reporting the incremental contribution of the TEIQue global score (Andrei et al., 2016). Additionally, only Siegling et al. (2015b) reported the incremental validity of the TEIQue domain scores, after controlling for the FFM, in predicting negative emotional states. Ultimately, recent literature has started to alleviate some of the initial criticism surrounding the efficacy of trait EI as a useful construct within psychological research and clinical practice. However, further research is needed to investigate whether the domains of the TEIQue (wellbeing, emotionality, sociability, and self-control) demonstrate incremental validity beyond the FFM in predicting levels of negative emotional states (i.e., depression, anxiety, and stress), and potential operate as protective factors in a large, community-based Australian Sample, which has yet to be investigated (Andrei et al., 2016).

2. Study 1

The first study serves to clarify whether trait EI is a repackaging of the FFM, or indeed a distinct construct with its own utility. This was achieved by investigating the incremental validity of the TEIQue domains (wellbeing, emotionality, sociability, and self-control). To demonstrate incremental validity, hierarchical regression models were constructed investigating the additional variance accounted for by the TEIQue domains when predicting negative emotional states (depression, anxiety, and stress), after controlling for the FFM. It was hypothesised that trait EI domains would significantly contribute to regression models predicting depression, anxiety, and stress, after accounting for the FFM.

3. Method

3.1. Participants

This study recruited a community based sample of 386 participants aged between 18-73 years, using convenience sampling through online participant recruitment platform, Prolific. An a priori G-power analysis, with alpha set at .05, and statistical power at .95, anticipating a small effect size, recommended a minimum sample of 245 participants in order to detect a relationship between the chosen variables. The sample characteristics of the current study are displayed in Table 1. Participants were recruited between May and December of 2020, and inclusion criteria for the current study required participants to be currently residing in Australia to avoid the possibly of residing country confounding results during the COVID-19 pandemic. Individuals who self-reported a current psychological condition (e.g., mood disorders, anxiety disorders, psychotic disorders etc.) or COVID-19 diagnosis were excluded.

3.2. Materials

Trait Emotional Intelligence Questionnaire (TEIQue). The TEIQue short form (Cooper and Petrides, 2010) is a widely used measure of trait EI. The questionnaire consists of 30-items scored on a 7-point Likert scale ranging from 1-7 (completely disagree to completely agree), with half the items reversed scored. A total trait EI score is calculated by averaging the responses for each item, with a higher score indicating greater levels of trait EI. Additional domain scores (emotionality, wellbeing, sociability, and self-control) are computed via averaging relevant responses from the respective subscales. The scale showed high internal consistency in the current study (trait EI α = .92; emotionality α = .76; wellbeing α = .85; sociability α = .77; self-control α = .72).

Mini-International Personality Item Pool (IPIP). The Mini-IPIP was used in the current study to assess the FFM of personality (Baldasaro et al.,

Table 1. Demographic characteristics of the sample (N = 386).

Variable	*n* (%)	*M*(SD)
Age		29.99 (10.90)
Gender		
Female	210 (54.4)	
Male	175 (45.3)	
Missing Data	1 (.3)	
Education		
≤ Year 10	3 (.8)	
Year 12	52 (13.5)	
TAFE/Trade School	18 (4.7)	
Graduate diploma	6 (1.6)	
Graduate certificate	13 (3.4)	
Bachelor degree	77 (19.9)	
4th Year Bachelor (Honours) degree	22 (5.7)	
Master's degree	37 (9.6)	
PhD or Doctorate	15 (3.9)	
Missing Data	143 (37)	

Notes. M = Mean; SD = Standard Deviation.

2013). The scale comprises of 20-items assessing five personality traits (4-items per trait): extraversion, neuroticism, openness, agreeableness, and conscientiousness. Participants respond to each item using a 5-point Likert scale ranging from 1-5 (strongly agree to strongly disagree), with several items reversed scored. A total score for each personality trait is obtained by summing responses on the items for the respective personality trait. Higher scores indicate a greater level of the respective personality trait. In this study the Mini-IPIP has demonstrated varied internal consistency, with conscientiousness, and neuroticism, subscales below recommended levels (extraversion α = .79; agreeableness α = .73; conscientiousness α = .63; neuroticism α = .68; openness α = .70).

Depression Anxiety and Stress Scale (DASS-21). The DASS-21 was used to assess levels of depression, anxiety, and stress (Lovibond and Lovibond, 1995). Participants read 21 statements and judge the degree each statement applied to them over the past week using a 4-point Likert scale (0 = "Did not apply to me at all"; 1 = "Applied to me to some degree, or some of the time"; 2 = "Applied to me to a considerable degree, or a good part of time"; 3 = "Applied to me very much, or most of the time"). Seven statements correspond to each of the three negative emotional states (i.e., depression, anxiety, and stress). A score for each negative emotional state is calculated by summing participants' responses providing a score between 0-21, with higher scores suggesting greater intensity of the respective negative emotional state. The DASS-21 showed sound internal consistency in the current study (depression α = .92; anxiety α = .84; stress α = .87).

3.3. Procedure

An online link to the survey platform Qualtrics directed participants to the Inquisit software platform (version 6), created by Millisecond®, for completion of the survey (combining various questionnaires as part of a larger study investigating psychological constructs during the COVID-19 pandemic). Ethical approval was granted by the Victoria University Human Research Ethics Committee (HRE20-053) and the current study complies with all ethical guidelines. Respondents initially provided voluntary and informed consent before completing a brief demographic questionnaire ascertaining eligibility to participate in the current study, followed by the relevant questionnaires in a predetermined order (DASS-21, IPIP, and TEIQue, among a larger battery). All questions required mandatory responses to minimise the impact of missing data, however participants were able to close the program and withdraw from the study at any time. Data from respondents who completed the entire survey in less than 30 min were not included in the current study to increase the

likelihood that participants actively engaged with the items on the survey.

3.4. Statistical design

Data from participants' questionnaire responses were collated, cleaned, and analysed using IBM® Statistical Package for the Social Sciences (SPSS®) version 27. Data screening was conducted to check for assumptions and accuracy of data entry.

The primary analysis included three hierarchical multiple regressions using the FFM personality traits (i.e., extraversion, neuroticism, openness, agreeableness, and conscientiousness) as predictor variables at step 1, and then adding the TEIQue domains (i.e., emotionality, wellbeing, sociability, and self-control) as predictor variables at step 2, to predict depression, anxiety, and stress separately.

All assumptions of multiple regression were tested and met. Firstly, using the outlier labelling rule, no univariate outliers were detected (Hoaglin and Iglewicz, 1997). Collinearity statistics indicated no multi-collinearity; VIF values for each of the predictor variables were below 10 and ranged between 1.081-2.691, and tolerance statistics were above .2 and ranged between .372-.925 for all three multiple regressions (Field, 2013). A histogram and normal probability plot of standardised residuals supported normality and linearity of residuals. Lastly max Mahalanobis distance detected nine multivariate outliers which were removed from the analysis, and an additional 18 participants were excluded due to missing values. A final, adequately powered sample of 363 participants remained for the following analyses.

4. Results

Preliminary analysis obtained the descriptive statistics and correlations for variables assessed in the current study. Results are presented in Table 2. Three hierarchical multiple regressions were conducted to assess the relationship between trait EI and depression, anxiety, and stress, controlling for the FFM personality traits. Tables 3, 4, and 5 present the beta values, standard errors, and standardised beta values from the multiple regression analyses, along with part and partial correlations.

The first hierarchical multiple regression showed a significant model at step 1 $F (5,357) = 39.690$, $p < .001$, $R^2 = .357$ indicating the FFM personality traits were significant predictors of sample depression scores. At step 1 of the model, neuroticism, agreeableness, and conscientiousness were all unique significant contributors to the model. The model continued to be significant at step 2 $F (9,353) = 44.780$, $p < .001$, $R^2 = .533$. Adding the EI subscales as predictor variables resulted in a significant change ($p < .001$). Wellbeing was the largest significant, unique contributor to the model. Neuroticism was found to make the second largest significant, unique contribution to the model. Emotionality was also a unique significant contributor to the model. With the variance accounted for by the EI subscales, agreeableness and conscientiousness were no longer significant predictors, while extraversion and openness emerged a significant unique contributor to the model at step 2.

The second hierarchical multiple regression showed a significant model at step 1 $F (5,357) = 27.764$, $p < .001$, $R^2 = .280$ indicating the FFM personality traits were significant predictors of participants' anxiety scores. At step 1 of the model, neuroticism, and conscientiousness were the only unique significant contributors to the model. The model continued to be significant at step 2 $F (9,353) = 23.226$, $p < .001$, $R^2 = .371$. Adding EI subscales as predictor variables resulted in a significant change ($p < .001$). Neuroticism was the largest significant, unique contributor to the model, followed by emotionality. The inclusion of emotional intelligence in step two resulted in extraversion emerging as a significant contributor to the model. However, conscientiousness was no longer a significant predictor after adding EI to the model.

The third hierarchical multiple regression showed a significant model at step 1 $F (5,357) = 52.369$, $p < .001$, $R^2 = .423$ indicating the FFM personality traits were significant predictors of sample stress scores. At

Table 2. Descriptive statistics and correlations for TEIQue, IPIP, and DASS-21 (N = 363).

Variable	M(SD)	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Emotional Intelligence	4.67 (.71)	-												
2. Emotionality	4.77 (.85)	.798**	-											
3. Wellbeing	5.01 (.97)	.853**	.584**	-										
4. Sociability	4.44 (.86)	.755**	.473**	.525**	-									
5. Self-control	4.43 (.83)	.790**	.485**	.608**	.514**	-								
6. Extraversion	11.14 (3.58)	.490**	.400**	.420**	.522**	.205**	-							
7. Conscientiousness	13.80 (2.92)	.393**	.268**	.300**	.273**	.356**	.056	-						
8. Agreeableness	15.21 (2.67)	.443**	.588**	.352**	.314**	.140**	.384**	.149**	-					
9. Neuroticism	11.28 (3.03)	-.566**	-.317**	-.507**	-.344**	-.672**	-.151**	-.238**	-.077	-				
10. Openness	14.64 (2.95)	.311**	.374**	.206**	.290**	.172**	.209**	.052	.314**	-.125*	-			
11. Depression	5.92 (5.13)	-.659**	-.468**	-.650**	-.403**	-.550**	-.198**	-.313**	-.179**	.546**	-.045	-		
12. Anxiety	4.88 (4.34)	-.515**	-.404**	-.422**	-.329**	-.511**	-.077	-.235**	-.124*	.510**	-.095	.682**	-	
13. Stress	6.90 (4.47)	-.536**	-.377**	-.432**	-.297**	-.625**	-.050	-.254**	-.096	.638**	-.087	.736**	.765**	-

Notes: M = Mean; *SD* = Standard Deviation.
* Significant at .05 level.
** Significant at .01 level.

Table 3. Results of the hierarchical multiple regression analysis using personality traits and emotional intelligence as predictors of depression (N = 363).

	R^2	b	SE B	β	t	p	Partial	Part
Model 1	.357					< .001		
Extraversion		-.128	.067	-.090	-1.925	.055	-.101	-.082
Conscientiousness		-.315	.077	-.179	-4.065	< .001	-.210	-.172
Agreeableness		-.200	.092	-.104	-2.174	.030	-.114	-.092
Neuroticism		.831	.075	.491	11.081	< .001	.506	.470
Openness		.134	.078	.077	1.709	.088	.090	.073
Model 2	.533					< .001		
Extraversion		.138	.066	.096	2.095	.037	-.198	.111
Conscientiousness		-.117	.070	-.067	-1.676	.095	-.313	-.089
Agreeableness		.135	.091	.070	1.483	.139	-.179	.079
Neuroticism		.427	.085	.252	5.031	< .001	.546	.259
Openness		.242	.070	.140	3.482	.001	-.045	.182
Emotionality		-1.273	.337	-.211	-3.777	< .001	-.468	-.197
Wellbeing		-2.259	.288	-.425	-7.853	< .001	-.650	-.386
Sociability		-.506	.303	-.084	-1.668	.096	-.403	-.088
Self-control		-.037	.371	-.006	-.099	.921	-.550	-.005

Notes: b = beta values; SE B = standard errors; β = standardised beta values.

step 1 of the model, neuroticism, and conscientiousness were the only unique significant contributors to the model. The model continued to be significant at step 2 $F(9,352) = 39.758$, $p < .001$, $R^2 = .503$. Adding EI subscales as predictor variables resulted in a significant change ($p < .001$). Neuroticism was found to make the largest significant, unique contribution to the model. Self-control was the second largest significant, unique contributor to the model. Emotionality, and extraversion were also unique contributor to the model. However, extraversion was only significant at step 2, with conscientiousness no longer a significant predictor once adding EI to the model.

5. Discussion

The aim of this study was to investigate the utility of trait EI as a psychological construct by demonstrating incremental validity in predicting negative emotional states after accounting for the FFM of personality. In support of the hypothesis, when added to each regression model separately for depression, anxiety, and stress, trait EI domains significantly increased the variance accounted for after controlling for the effects of extraversion, conscientiousness, agreeableness, neuroticism, and openness.

The correlation analysis revealed significant relationships between trait EI and all personality traits of the FFM, with the strongest relationship between overall trait EI and neuroticism. These findings are supported by previous research (Arteche et al., 2008; de Haro García and Costa, 2014; Gannon and Ranzijn, 2005; Prentice and King, 2013; Saklofske et al., 2007; Siegling et al., 2015a). However, the negative relationship with neuroticism was weaker than previously reported (Alegre et al., 2019; Siegling et al., 2015b; van der Linden et al., 2017), indicating that trait EI as measured by the TEIQue is likely not a repackaging of the FFM, or simply the inverse or absence of neuroticism.

Consistent with previous research, trait EI domains (emotionality, wellbeing, sociability, and self-control), were found to significantly predict all three negative emotional states (Chirumbolo et al., 2019; Kousha et al., 2018; Mikolajczak et al., 2007; Tannous and Matar, 2010). Incorporating EI into the models after accounting for the FFM resulted in significant improvements in variance accounted for, adding an additional 17.6%, 9.1%, and 8% in predicting depression, anxiety, and stress, respectively. The additional variance explained aligns with previous studies on incremental validity of the TEIQue (Andrei et al., 2016; Chirumbolo et al., 2019; Siegling et al., 2015a), and runs contrary to the

Table 4. Results of the hierarchical multiple regression analysis using personality traits and emotional intelligence as predictors of anxiety (N = 363).

	R^2	b	SE B	β	t	p	Partial	Part
Model 1	.280					< .001		
Extraversion		.043	.060	.036	.721	.471	.038	.032
Conscientiousness		-.163	.069	-.110	-2.349	.019	-.123	-.105
Agreeableness		-.131	.083	-.081	-1.586	.114	-.084	-.071
Neuroticism		.690	.067	.482	10.268	< .001	.477	.461
Openness		-.017	.070	-.011	-.236	.814	-.012	-.011
Model 2	.371					< .001		
Extraversion		.189	.065	.156	2.914	.004	.153	.123
Conscientiousness		-.024	.069	-.016	-.349	.727	-.019	-.015
Agreeableness		.096	.090	.059	1.067	.286	.057	.045
Neuroticism		.427	.083	.298	5.123	< .001	.263	.216
Openness		.090	.068	.061	1.316	.189	.070	.056
Emotionality		-1.376	.332	-.270	-4.152	< .001	-.216	-.175
Wellbeing		-.337	.283	-.075	-1.192	.234	-.063	-.050
Sociability		-.556	.298	-.110	-1.864	.063	-.099	-.079
Self-control		-.649	.365	-.123	-1.780	.076	-.094	-.075

Notes: b = beta values; SE B = standard errors; β = standardised beta values.

Table 5. Results of the hierarchical multiple regression analysis using personality traits and emotional intelligence as predictors of stress (N = 363).

	R^2	b	SE B	β	t	p	Partial	Part
Model 1	.423					< .001		
Extraversion		.091	.055	.073	1.655	.099	.087	.067
Conscientiousness		-.155	.064	-.101	-2.418	.016	-.127	-.097
Agreeableness		-.103	.076	-.062	-1.353	.177	-.071	-.054
Neuroticism		.913	.062	.620	14.752	< .001	.615	.593
Openness		-.001	.065	.000	-.012	.991	-.001	.000
Model 2	.503					< .001		
Extraversion		.164	.059	.131	2.763	.006	.145	.104
Conscientiousness		-.022	.063	-.014	-.349	.728	-.019	-.013
Agreeableness		.037	.082	.022	.454	.650	.024	.017
Neuroticism		.590	.076	.400	7.741	< .001	.381	.290
Openness		.076	.063	.050	1.212	.226	.064	.045
Emotionality		-.940	.303	-.179	-3.104	.002	-.163	-.116
Wellbeing		-.061	.258	-.013	-.236	.814	-.013	-.009
Sociability		-.015	.272	-.003	-.055	.956	-.003	-.002
Self-control		-1.590	.333	-.294	-4.772	< .001	-.246	-.179

Notes: b = beta values; SE B = standard errors; β = standardised beta values.

lower percentages in studies investigating other trait EI scales (Gannon and Ranzijn, 2005).

As expected, neuroticism was a stable positive, significant predictor of all negative emotional states, even after the inclusion of EI. Neuroticism is characterised by negative emotionality and consistently associated with low mood and anxiety (McCrae and Costa, 2010; Widiger and Oltmanns, 2017). The strength of neuroticism as a predictor declined in all three regression models following the inclusion of trait EI. This was expected considering both dimensions reflect emotional stability and wellbeing, and are consistently inversely related (Alegre et al., 2019; Dimitrijević et al., 2018; Siegling et al., 2015b). However, both were still unique contributors in all three regression models, demonstrating they are related, but distinct concepts.

The unique contribution of the current study was highlighting which of the trait EI domains was the most significant predictor of depression, anxiety, and stress. For depression, the wellbeing domain was the most significant predictor. The wellbeing domain encapsulates an individual's optimism, self-esteem, and level of life satisfaction (Petrides, 2009). Repeatedly, studies have demonstrated these facets of wellbeing are

protective factors from depression (Carver and Gaines, 1987; Orth and Robins, 2013; Sowislo and Orth, 2013). Following neuroticism, the emotionality domain was the most significant predictor of anxiety. Emotionality reflects an individual's empathy, emotional expressiveness and relationship quality (Petrides, 2009). Leach et al (2013) demonstrated that high quality supportive relationships reduced levels of anxiety. Resilience to anxiety during the Covid-19 pandemic has also been positively related to quality, supportive relationships (Nola et al., 2021). Furthermore, being able to effectively communicate your emotional experiences was related to reduced symptoms of anxiety in a large college sample (Kahn and Garrison, 2009). Collectively, these studies support the association between emotionality facets and reduced anxiety.

Lastly, second to neuroticism, self-control was the most significant predictor of stress. These results are unsurprising as subsumed within the domain of self-control is the ability to manage stress and regulate emotional experiences (Petrides, 2009). Individuals high in this trait are suggested to be capable of tolerating high pressure situations and controlling their emotions (Andrei et al., 2016). Interestingly, sociability did not significantly predict any negative emotional state. Similar

results were reported by Siegling et al. (2015a) who found sociability as measured on the TEIQue consistently failed to predict depression, anxiety, stress, life satisfaction, and amotivation. The sociability subscale reflects an individual's capacity to influence the emotions of others, act assertively, and be aware of the social consequences of their behaviour (Petrides, 2009). It is possible that, with the inclusion of the other TEIQue domains and the FFM, sociability was unable to predict sufficient unique variance. Alternatively, social awareness and the emotional management of others may not be consequential skills in relation to depression, anxiety, and stress. The current study succeeded in demonstrating the incremental validity of the TEIQue, and discredits the notion that trait EI too closely resembles other established personality measures. The cumulative evidence shows consistent relationships between specific TEIQue domains, neuroticism, and negative emotional states and further studies are needed to elucidate the nature of these relationships.

6. Study 2

Previous research has well established the link between neuroticism and negative emotional states, which is expected as the trait represents an individual's emotional sensitivity and disposition to experience negative emotions (McCrae and Costa, 2010; Widiger and Oltmanns, 2017). In support of this, meta-analyses have demonstrated how neuroticism is strongly related to increased risk of psychological dysfunction, particularly anxiety and depressive disorders (Kotov et al., 2010; Uliaszek et al., 2010). Moreover, individuals with high levels of neuroticism are more likely to report higher daily stress, and use less effective coping strategies when faced with a stressor (Cohen et al., 1999; Denney and Frisch, 1981). However, trait EI has been theorised to be a protective factor from negative emotional states, due to this construct's positive relationship with life satisfaction and psychological wellbeing, and negative relationships with depression, anxiety, and stress (Karim and Shah, 2014; Martínez-Monteagudo et al., 2019; Mavroveli et al., 2007).

Our first study demonstrated which TEIQue domains were most strongly related to negative emotional states. Wellbeing was negatively related to depression, emotionality was negatively related to anxiety, and self-control was negatively related to stress. Therefore, the purpose of this second study was to investigate whether these EI factors acted as potentially protective factors from pervasive negative moods by mediating the well-established relationship between Neuroticism and negative emotional states. Positive findings would provide further evidence for the clinical utility of Trait EI as measured by the TEIQue. It was hypothesised that: (1) the relationship between neuroticism and depression would be partially mediate by wellbeing; (2) the relationship between neuroticism and anxiety would be partially mediated by emotionality; and (3) the relationship between neuroticism and stress would be partially mediated by self-control.

7. Method

7.1. Participants

The current study used the same community based sample as the initial study, however, the sample was larger due to a decrease in missing data ($n = 653$, aged between 18-79 years). Sample characteristics for this study can be found in Table 6. Similar to the initial study, participants were required to be currently residing in Australia, and individuals who self-reported a current psychological condition or COVID-19 diagnosis were excluded.

7.2. Materials and procedure

The data for the current study was collected concurrently with Study 1, and using the same materials and procedure.

Table 6. *Demographic Characteristics of the Sample (N = 653).*

Variable	n (%)	M(SD)
Age		30.20 (11.04)
Gender		
Female	318 (48.7)	
Male	334 (51.1)	
Missing Data	1 (.2)	
Education		
≤ Year 10	8 (1.2)	
Year 12	121 (18.5)	
TAFE/Trade School	36 (5.5)	
Graduate diploma	14 (2.1)	
Graduate certificate	29 (4.4)	
Bachelor degree	168 (25.9)	
4th Year Bachelor (Honours) degree	36 (5.5)	
Master's degree	88 (13.5)	
PhD or Doctorate	23 (3.5)	
Missing Data	129 (19.8)	

Notes. M = Mean; SD = Standard Deviation.

7.3. Statistical design

Participants' responses were again collated, cleaned, and analysed using IBM® SPSS® version 27. The primary procedure included three mediation analyses, requiring the use of Hayes Process Macro Tool (version 3.5) extension for SPSS®. These analyses included investigating whether wellbeing mediated the relationship between neuroticism and depression, whether emotionality mediated the relationship between neuroticism and anxiety, and whether self-control mediated the relationship between neuroticism and stress. These TEIQue domains were selected as mediators for the current analysis because they were identified as the strongest predictors of negative emotional states in study 1 (alongside neuroticism). For all three mediation analyses, bootstrapping was set at 5000 samples with 95% confidence intervals when estimating effects of each coefficient, as per the recommendations of experts within the field (Field, 2013).

8. Results

The first mediation analysis investigating whether wellbeing mediated the relationship between neuroticism and depression was found to be significant $F(2,650) = 318.770, p < .001$, and the model is presented in Figure 1. The total effect of neuroticism on depression was significant b = .870, 95% CI [.772, .984], $t = 16.316, p < .001$. As shown in Figure 1, the direct effect of neuroticism on depression remained significant after accounting for wellbeing, $t = 8.495, p < .001$. However, the indirect effect showed wellbeing partially mediated the relationship between neuroticism and depression through a significant non-zero effect (Sobel Test = 11.01, $p < .001$).

The second mediation analysis investigating whether emotionality mediated the relationship between neuroticism and anxiety was found to be significant $F(2,650) = 128.085, p < .001$, and the model is presented in Figure 2. The total effect of neuroticism on anxiety was significant b = .642, 95% CI [.554, .729], $t = 14.351, p < .001$. As shown in Figure 2, the direct effect of neuroticism on anxiety remained significant after accounting for the emotionality, $t = 11.846, p < .001$. However, the indirect effect showed emotionality partially mediated the relationship between neuroticism and anxiety through a significant non-zero effect (Sobel Test = 5.01, $p < .001$).

The last mediation analysis investigating whether self-control mediated the relationship between neuroticism and stress was found to be significant $F(2,650) = 276.937, p < .001$, and the model is presented in Figure 3. The total effect of neuroticism on stress was significant b =
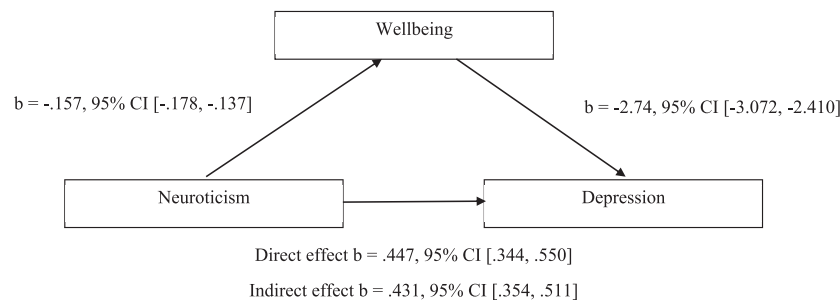
Figure 1. Mediation model depicting the relationship between neuroticism, wellbeing, and depression.
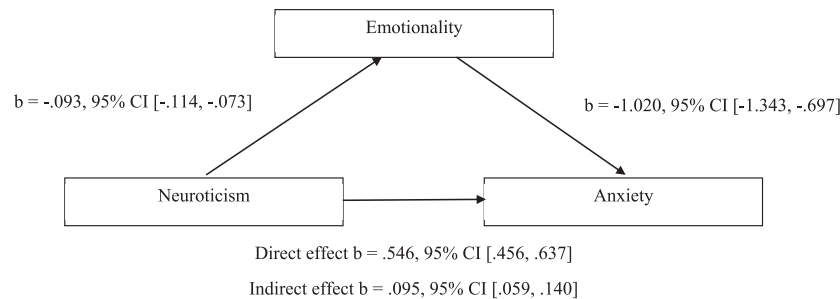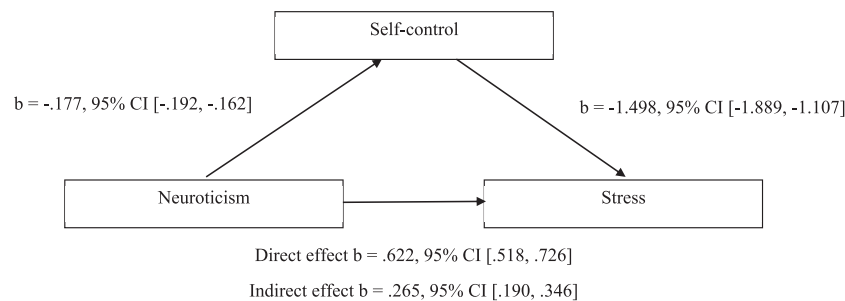

Figure 2. Mediation model depicting the relationship between neuroticism, emotionality, and anxiety.

Discussion

Figure 3. Mediation model depicting the relationship between neuroticism, self-control, and stress.

.887, 95% CI [.806, .969], $t = 21.400$, $p < .001$. As shown in Figure 3, the direct effect of neuroticism on stress remained significant after accounting for the self-control, $t = 11.707$, $p < .001$. However, the indirect effect showed self-control partially mediated the relationship between neuroticism and stress through a significant non-zero effect (Sobel Test = 7.15, $p < .001$).

9. Discussion

The aim of the second study was to investigate whether trait EI domains act as a potential protective factor from negative emotional states. The strongest trait EI predictor of depression, anxiety, and stress identified in Study 1 were investigated as mediators in the relationship between neuroticism and the respective negative emotional state. In accordance with the hypotheses: (1) Wellbeing partially mediated the relationship between neuroticism and depression; (2) emotionality partially mediated the relationship between neuroticism and anxiety; and (3) self-control partially mediated the relationship between neuroticism and stress.

Similar to study 1, neuroticism maintained strong relationships with depression, anxiety, and stress. These results have been consistently replicated in previous research (Dimitrijević et al., 2018; Siegling et al., 2015b; Widiger and Oltmanns, 2017). They also align with the dominant conceptualisation of neuroticism as a trait characterised by negative emotionality, anxiety, and low mood (McCrae and Costa, 2010).

The critical findings of the current study related to the mediating role of trait EI domains in the relationship between neuroticism and negative emotional states. These findings suggest that trait EI may be an ideal target for interventions to assist individuals prone to experiencing pervasive negative emotional states to improve their overall mood. Since improvements in wellbeing were shown to partially mediate the relationship between neuroticism and depression, intervention aimed at building higher self-esteem and optimistic outlooks may work to minimise depressive tendencies in highly neurotic individuals. In support of this notion, previous literature has demonstrated a clear inverse relationship between self-esteem, optimism, and depression (Orth and Robins, 2013; Sowislo and Orth, 2013). Furthermore, as expected emotionality was found to partially mediate the relationship between neuroticism and anxiety, reemphasising past findings regarding the importance of establishing high quality supportive relationships in reducing symptoms of anxiety (Leach et al., 2013). Lastly, self-control was found to partially mediate the relationship between neuroticism

and stress. Central to the domain of self-control is effective emotional regulation. Kharatzadeh et al. (2020) showed the efficacy of emotional regulation training for intensive and clinical care nurses who experienced significant reduction in depression, anxiety, and stress. Potentially similar interventions could be constructed promoting self-control through training effective emotional regulation techniques, particularly to neurotic individuals, as a means of building resilience against negative emotional experiences.

10. General discussion

EI as a construct is well into its third decade of research and numerous measures have been developed to assess the construct. The TEIQue is amongst the most commonly used measures of trait EI, and studies have shown conflicting results regarding its relationship with the FFM of personality (Arteche et al., 2008; de Haro García and Costa, 2014; Dimitrijević et al., 2018; Hjalmarsson and Dåderman, 2020; Pérez-González and Sanchez-Ruiz, 2014; Petrides et al., 2007a; Siegling et al., 2015a,b). Study 1 demonstrated the incremental validity of the four TEIQue domains in predicting depression, anxiety, and stress, beyond the FFM in a large community based sample. The findings appear to refute the idea that trait EI, as measured on the TEIQue too closely resembles the FFM (Brody, 2004) and validates the endorsement made by O'Connor and colleagues (2019) that the TEIQue is indeed the measure of choice for trait EI. However, it should be noted that sociability did not significantly predict any negative emotional state, beyond the FFM. Sociability was unable to account for sufficient unique variance beyond the other three TEIQue domains. This result suggests that social awareness and the emotional management of others may not be as important to prevent depression, anxiety, and stress, compared to the emotional traits encapsulated by wellbeing, emotionality, and self-control (i.e., self-efficacy, optimism, social support, empathy, and emotional regulation).

Since the inception of EI, there have been many critics of the construct within the research community. However, the findings from study 2 demonstrate that specific trait EI domains partially mediate the commonly observed relationship between neuroticism and negative emotional states. This ultimately suggests that the negative emotional experiences commonly observed in neurotic individuals can be at least partially explained through particular trait EI deficits. It was specifically found that wellbeing, emotionality, self-control may operate as potential protective factors from depression, anxiety, and stress, respectively. This makes EI an ideal target for interventions aiming to assist those who regularly experiences persistent negative emotional states. The shortcomings of EI may have well and truly been overstated (Ashkanasy and Daus, 2005) as the utility of trait EI intelligence has been demonstrated in the current study.

The findings of the current study should be interpreted in light of its limitations. Firstly, data collection was conducted during a global pandemic while Australia citizens were under varying stages of lockdown. Research is currently emerging showing a significant increase in mental health related issues (e.g., depression, sleep disturbances) during periods of social distancing and lockdown restrictions (Banks and Xu, 2020; Gualano et al., 2020). The potential ramifications of this unique event in history on the variables measured in the current study is important to acknowledge, particularly in relation to negative emotional states. Secondly, the current study only investigated the four domains of the TEIQue: emotionality, wellbeing, sociability, and self-control, rather than the individual 15 facets (Petrides, 2009). Future research utilising the full version of the TEIQue should explore the relationships between the 15 facets and negative emotional states to highlight which specific aspects of the four domains serve as protective factors against depression, anxiety, and stress. Additionally, the sample intentionally comprised of participants without a current psychological condition limiting the generalisability of the results. It is unclear whether the same partially mediated relationships would be observed within clinical populations.

Lastly, it should be noted that internal consistency values for the subscales of the Mini-IPIP fell into the acceptable (openness, extraversion and agreeableness) and questionable (neuroticism and conscientiousness) ranges. However, this measure offered a degree of parsimony that was desired since this study was conducted as part of a large survey containing over 400 questions from 12 different measures.

The findings of the current study have implications for future research. Firstly, the study contributes to the growing body of literature demonstrating the utility of trait emotional intelligence as measured on the TEIQue. Specifically, that wellbeing, emotionality, and self-control capture unique variance in negative emotional states, beyond the FFM. Future research investigating associations between depression, anxiety, stress and other constructs may wish to consider how these TEIQue domains influence the relationship. Furthermore, given that EI was consistently inversely associated with depression, anxiety and stress, and there is tentative evidence that trait EI may operate as a protective factor from pervasive negative moods, it would be interesting to establish whether EI acts as a protective factor from prolonged negative mood states, particularly in clinical populations. Based on the results of the current study improving self-efficacy, emotional- and self-regulation may be critical in managing depression, anxiety, and stress. Dialectic behavioural therapy is one of the third wave behaviour therapies focused on skill training in mindfulness, distress tolerance, emotional regulation and interpersonal effectiveness, which has been successfully used in preventative mental health care (Budak and Kocabaş, 2019). Incorporating elements of emotional intelligence skills training into existing dialectic behavioural therapies may yield improved results. Promising research has also emerged with regards to the protective benefits of training EI in children (Davis et al., 2019), therefore research to investigate the efficacy of training and fostering the development of EI, as a means to combat rising rates of depression utilising healthy adult or clinical samples is called for. It is important to note that despite the large samples recruited for studies 1 and 2, the relationships between TEIQue subscales and depression, anxiety, and stress maintained a moderate strength. Therefore, future studies investigating the relationship between the TEIQue and negative emotional states, based on G-power analyses, would suffice with a sample size of at least 100 participants (note this value is subject to increase with the addition of other variables).

In summation, the findings provide further support for the utility of EI, adding incremental validity in predicting negative emotional states beyond the FFM personality traits. As conceptually intended, trait EI as measured by the TEIQue reflects an individual's emotion-related self-perceptions (Petrides, 2009), and was inversely related to negative emotional states. Three EI domains were also found to mediate the relationship between neuroticism and differing negative emotional mood states. Thus, it is therefore unreasonable to claim that trait EI is identical to the FFM. Instead, trait EI was found to represent a related, yet distinct trait that stands apart from the FFM, and operates as a potential protective factor from negative emotional experiences.

Declarations

Author contribution statement

Stjepan Sambol: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Emra Suleyman, Jessica Scarfo and Michelle Ball: Conceived and designed the experiments; Analyzed and interpreted the data; Wrote the paper.

Data availability statement

Data will be made available on request.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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