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Abstract

Emotional intelligence (EI) has been reliably linked to better mental health (Martins, Ramalho, & Morin, 2010), though descriptive associations reveal little about *how* and *when* such adaptive outcomes arise. Whilst there is some evidence to suggest that 'trait' EI may operate as a protective resource within stress-illness processes (e.g., Mikolajczak, Roy, Luminet, Fillée, & de Timary, 2007), the role of 'ability' EI in this regard appears unclear (e.g., Matthews et al., 2006). Moreover, few studies have simultaneously examined relations between EI, chronic stressors and mental health in adolescents. The current study explored whether EI moderated the relationship between a range of stressors (family dysfunction; negative life events; and socio-economic adversity) and self-reported mental health (depression and disruptive behaviour symptomatology) in a sample of 405 adolescents (mean age 13.09 years). Moderated regression analyses found that whilst high levels of trait EI attenuated stressor-mental health relations, high levels of ability EI amplified associations, although both effects showed specificity with respect to stressor type and disorder. Implications for the EI construct and related intervention programmes are discussed.

Keywords: emotional intelligence; mental health; depression; disruptive behaviour; stress; adolescence

1. Introduction

Emotional intelligence (EI) captures individual differences in the way one experiences, identifies, understands, regulates and utilises *self*-related and *other*-related emotions (Petrides & Furnham, 2001). Whilst the overall validity of the construct is still fervently debated (Brody, 2004; Mayer, Salovey, & Caruso, 2008; Zeidner, Matthews, & Roberts, 2009), the field continues to prosper. EI is classified in one of two ways: as a distinct group of mental *abilities* in emotional functioning, termed 'ability EI' (AEI), or as a cluster of emotion-related *self-perceptions* and dispositions, known as 'trait EI' (TEI) (Petrides & Furnham, 2001). In each case the preferred conceptualisation dictates the method of assessment. Whilst AEI lends itself to measures of *maximal performance*, akin to cognitive testing (i.e. external appraisal), TEI is assessed via self-report measures tapping *typical performance* (i.e. internal appraisal) in the vein of traditional personality assessment (**Zeidner et al., 2009**). Recent empirical investigation has consistently corroborated this distinction, with negligible statistical associations reported between measures of AEI and TEI in adults (e.g., Brackett & Mayer, 2003) and youth populations (e.g., Williams, Daley, Burnside, & Hammond-Rowley, 2009). Proponents of EI purport that 'intelligent' utilisation of emotion-related knowledge/allied skills *and*

positive perceptions of competency to handle emotion-laden situations are imperative for successful adaptation (Mayer & Salovey, 1997; Petrides, Pita, & Kokkinaki, 2007). Empirically, research has begun to emerge in support of this theoretical conjecture. EI is reliably associated with better mental health (Martins et al., 2010). In adults, higher AEI appears more specifically related to lower levels of externalising symptomatology (e.g., Brackett, Mayer, & Warner, 2004) whereas TEI is strongly predictive of internalising disorders (e.g., Gardner & Qualter, 2010). Notably, the adult trend has been replicated in youth populations with respect to AEI but not TEI, where substantial inverse associations with both mood *and* behavioural disorders have been reported (e.g., Williams et al., 2009). However, research exploring simple EI-mental health associations precludes inferences as to the underlying *processes* underpinning these relationships; in other words, *how* (whether directly or indirectly linked to known stress-illness processes) and *when* (within which context) EI influences adaptation (Zeidner et al., 2009).

1.1 Stressors, mental health and EI

Conceived as a core latent trait/resource driving behaviour, individual differences in emotionally intelligent competencies could underpin variation in the *experience* of stressors (e.g., emotional perception or management may impact initial reactivity) such that low levels of EI confer vulnerability, whilst high levels function as a protective resource (Zeidner et al., 2009).

Commentators have made attempts to locate EI within existing transactional models of health (e.g., van Heck & den Oudsten, 2008). However, research exploring EI-stressor-health pathways has been principally concerned with the role of trait vs. ability EI, in experimental contexts, with adult

populations – despite the pressing need to better understand ‘resilience’ processes and overwhelming evidence implicating a wide array of chronic (e.g., poverty) and acute environmental stressors (e.g., negative life events) in the onset and maintenance of psychopathology (Grant, Compas, Thurm, McMahon, & Gipson, 2004). Moreover, current literature is equivocal; there is evidence to suggest that when faced with experimentally-induced (i.e. acute) stress, TEI promotes resistance by attenuating both psychological and physiological reactivity (Laborde, Brüll, Weber, & Anders, 2011; Mikolajczak et al., 2007) though the role of TEI in modifying chronic stress is less conclusive. Whilst Ciarrochi et al., (2002) found that adults with high levels of perceived competency in ‘managing others’ emotions’ experienced less suicidal ideation when faced with daily hassles, TEI failed to modify the effects of hassles on physical health and psychological wellbeing (Day, Therrien, & Carroll, 2005). Furthermore, contrary to theory, AEI does not appear to afford protection and in fact predicts *increased* negative emotionality when faced with acute lab-based stressors (Matthews et al., 2006), and, although found to protect against a specific form of chronic stress (childhood sexual abuse), this has only been documented in a small ($N = 54$), clinically-referred population (i.e., adolescents with a history of self-injurious behaviours) (Cha & Nock, 2009). In ‘typical’ adults exposed to daily hassles, evidence suggests high levels of AEI (perceiving emotion) *increases* risk for internalising disorders (Ciarrochi, Dean, & Anderson, 2002).

1.2 The present study

Research examining stressor-EI-mental health relationships in adolescence is presently limited – particularly with respect to AEI and chronic stressors. It is also apparent that we are some way

from disentangling the complexities of these relations; the effects of EI may be stressor *and* outcome specific – for instance, Ciarrochi et al., (2002) found that neither AEI nor TEI moderated the influence of major negative life events on health and, so far, effects have only been noted with respect to internalising disorders. Hence, the current study attempts to address these gaps by examining the moderating effect of TEI *and* AEI on a range of pertinent chronic stressors (socioeconomic adversity, family dysfunction, negative life events) in relation to both internalising *and* externalising symptomatology in youth.

2. Method

2.1 Participants

412 young people (214 females; 198 males) aged 11 to 16 years (mean = 13.09, *SD* = 1.07) were recruited from four schools located in the West Midlands, UK, selected via opportunity sampling. Parental consent and student assent was given in each case. Owing to time constraints, some participants did not complete all study measures (see section 2.2), though missing data amounted to less than 5% of the overall sample and was distributed randomly throughout the dataset (Little's MCAR test: $\chi^2 = 18.15$ (17) $p = .379$). Table 1 describes *n* per variable.

2.2 Materials

2.2.1 Trait emotional intelligence

Self-perceived emotional competency was measured using the Trait Emotional Intelligence Questionnaire-Adolescent Short Form (TEIQue-ASF; Petrides, 2009) which consists of 30 brief statements (e.g., “I find it hard to control my feelings”) collectively addressing *sociability* (e.g., emotion management of others; assertiveness) *emotionality* (e.g., emotional expression; perception of emotion in self/others); *self-control* (e.g., self-relevant emotional management; impulsiveness) and *well-being* (e.g., optimism; happiness). Young people respond using a seven-point scale; strongly disagree (1) to strongly agree (7). The measure yields a global TEI score (possible range 30 – 210), with higher scores indicative of higher levels of TEI. The TEIQue has demonstrated good levels of reliability and validity (Petrides, 2009) and in the present sample $\alpha = .81$.

2.2.2 Ability emotional intelligence

The Mayer-Salovey-Caruso Emotional Intelligence Test-Youth Version: Research Edition (*MSCEIT-YV R*; Mayer, Salovey, & Caruso, *in press*) comprises 101 items tapping skill in *experiential* (perceiving; using emotion to facilitate thought) and *strategic* (understanding; management) emotional information processing. For perceiving emotion, a series of faces are rated for emotional content on a 5-point scale; matching various sensory experiences (colour, temperature, speed) to different emotions using a 5-point scale indicates ability to use emotion; knowledge of emotion definitions, transitions/blends assesses emotional understanding, whilst rating the usefulness of particular strategies for attaining a target feeling (in the case of a vignette-based protagonist) taps management proficiency. Responses are scored by the test publishers (Multi-Health Systems) with items assigned a scaled value - 0 (less correct) to 2 (more correct) - signifying the degree of concordance with expert consensus opinion. Higher scores indicate higher agreement, hence higher

AEI skill. Averaged item scores create branch scores, from which average experiential and strategic area scores are derived, the mean of which yields a total AEI score (where standardised values: $M = 100$, $SD = 15$). As the MSCEIT-YVR is still under development, comprehensive psychometric testing is awaited. Nevertheless, preliminary analyses with the tool have yielded split-half reliabilities of .67 (perceiving) to .86 (understanding) and .90 for total AEI (Papadogiannis, Logan, & Sitarenios, 2009). In the present sample, branch and total scores were robustly inter-correlated ($r = .41$ [perceiving] - $.81$ [managing]), thus analyses were restricted to use of the total score representing the global AEI construct.

2.2.3 Mental health

The 20-item depression (feelings of sadness, negative thoughts, physiological symptoms) and disruptive behaviour (conduct and oppositional defiant disorder) scales from the Beck Youth Inventories of Emotional and Social Impairment, Second edition (*BYI II*; Beck, Beck, Jolly, & Steer, 2005) were utilised. Participants indicate how often each statement (e.g., “I feel lonely”) has been true for them recently using a 4-point scale; never (0) through to always (3). In both cases, higher summed item values (range 0 - 60) represent higher levels of disorder. Both scales have demonstrated excellent psychometric properties (Beck et al., 2005) and in the current sample internal consistency was $\alpha = .93$ (depression) and $\alpha = .87$ (disruptive behaviour).

2.2.4 Family dysfunction

The general functioning subscale of the McMaster Family Assessment Device (*FAD*; Epstein, Baldwin, & Bishop, 1983) comprises 12 short statements (e.g., “we don’t get along well together”)

tapping key dimensions of the family environment (e.g., problem-solving; communication; roles; behaviour control) to which participants indicate the extent of their agreement using a 4-point scale; strongly agree (1) to strongly disagree (4). Items are phrased to reflect 'healthy' or 'unhealthy' characteristics where following reversals, a higher total score (possible range 12 – 48) indicates greater family dysfunction (FD). The measure has demonstrated adequate test-retest reliability, ability to distinguish clinical/nonclinical families using clinician ratings and is internally consistent (Miller, Epstein, Bishop, & Keitner, 1985). In the present sample $\alpha = .82$.

2.2.5 Negative life events

The Adolescent Perceived Events Scale-Short Form (*APES-SF*; Compas, Davis, Forsythe, & Wagner, 1987) comprises a cumulative checklist of 90 items pertaining to normative and non-normative *major* (e.g., "arrest of a family member") and *daily* life events (e.g., "doing poorly on an exam/test") representative of adolescent experiences within academic, network, romantic, peer and family domains. Seven items were removed in order to minimise criterion contamination (e.g., "emotional worries"). A weighted sum of negative events was calculated from items endorsed by participants as occurring within the past four months *and* rated as having a negative impact (where a 9-point scale; extremely bad (-4) to extremely good (+4); was used to indicate event desirability). Higher scores reflected higher levels of perceived stressful negative life events (NLE). The APES has demonstrated adequate test-retest reliability over a two week period and high levels of inter-rater reliability (Compas et al., 1987).

2.2.6 Socio-economic adversity

The Family Affluence Scale (*FAS II*; Currie et al., 2004) consists of four accessible, non-sensitive items representative of family expenditure and consumption (e.g., “Does your family own a car, van or truck?”) to which categorical responses are assigned a value (e.g., “no” = 2; “yes, one” = 1; “yes, more than one” = 0). Summed item scores provide an indication of family material affluence/deprivation ranging between 0 (most affluent) and 9 (most deprived) (Currie et al., 2008). The authors note high rates of concordance between parent and child-reported FAS data though accept items could be susceptible to bias (i.e., car ownership might be influenced by factors associated with urban/rural living). Consequently, to fully capture family socio-economic adversity (SEA), school data pertaining to student free school meal eligibility (FSM) (coded yes = 1; no = 0) and neighbourhood level income deprivation scores (IDACI) obtained from centrally held records (National Pupil Database) supplemented FAS II information. Based on pupil postcodes, IDACI scores represent the percentage of youth in small areas of the country living in families that are income deprived. Scores range between 0 (least deprived) to 1 (most deprived) e.g., .54 indicates within that particular area, 54% of children are resident in families that are income deprived. The use of cumulative indices of adversity has precedence in the literature (e.g., Luthar, 1991) and has been recommended as an effective data reduction method to maximise statistical power (decreased measurement error whilst maintaining degrees of freedom) when examining a range of inter-related risk markers (i.e, SEA indices) with small samples and when other constructs are the primary focus of investigations (Burchinal, Roberts, Hooper, & Zeisel, 2000). Hence a composite measure of SEA was derived from the summation of FASII, FSM and IDACI scores (scale range 0 to 11), with higher scores indicative of higher levels of adversity.

2.3 Procedure

Delivery of measures was counterbalanced to minimise order effects. Students were given verbal and written instructions and completed questionnaires individually within the whole-class setting in the presence of a teacher and/or the researcher, who provided support where required, advised participants of their right to withdraw from the research without detriment and ensured confidentiality/independence of responding. Average completion time was one hour.

3. Results

Screening revealed seven univariate outliers (detached from the distribution with z-scores +/- 3.3 *SD* from the mean) which were subsequently removed (Tabachnick & Fidell, 2007). There were no multivariate outliers although depression, disruptive behaviour and the stressor variables were positively skewed. Log transformations were applied to the data though did not change the outcomes of main analyses; hence computations using untransformed data are reported in the interests of clarity.

3.1 Preliminary analyses

Table 1 displays descriptive statistics and intercorrelations for the study variables. Depression and disruptive behaviour were positively associated with all three stressors, though to a lesser extent with SEA (n.s. with depression). EI was inversely associated with symptomatology; TEI more

strongly than AEI, and with depression rather than disruptive behaviour. Consistent with previous research, AEI and TEI were only weakly related. Females had higher levels of AEI ($M = 96.22$, $SD = 12.78$) than males ($M = 87.66$, $SD = 13.36$), a difference which was statistically significant ($t(403) = 5.909$, $p < .001$). Whilst the same trend was noted with respect to TEI, this did not reach statistical significance. Females also reported significantly higher levels of depression ($M = 11.68$, $SD = 9.58$) than males ($M = 9.58$, $SD = 8.74$), $t(400) = 2.322$, $p < .05$, whilst the reverse was true for disruptive behaviour, with males reporting significantly higher levels ($M = 7.43$, $SD = 6.18$) than females ($M = 6.06$, $SD = 6.04$), $t(400) = 2.251$, $p < .05$. Only disruptive behaviour was associated with age ($r = .103$, $p < .05$). Subsequently, age and gender effects were controlled in the main analysis.

3.2 The moderating effect of EI on stressors and health

Procedures outlined by Aiken and West (1991) were employed to test for moderating effects via a series of hierarchical regressions. Predictor variables were standardised (mean-centred) before regressing the control variables (age and gender), EI (TEI; AEI), each stressor (FD; SEA; NLE) and the respective product term (i.e. EI x stressor) on depression and then disruptive behaviour. Scrutiny of partial regression plots suggested that SEA shared a curvilinear relationship to health variables; hence a quadratic, higher order term (SEA^2) was included in relevant analyses.

Neither AEI nor TEI significantly interacted with negative life events to predict mental health; however, TEI significantly modified the effect of FD on disruptive behaviour ($F(5, 374) = 16.98$, $p < 0.001$; $R^2_{adj} = .174$) but not depression, whilst AEI significantly moderated SEA on depression ($F(5, 396) = 4.14$, $p < 0.01$; $R^2_{adj} = .038$) but not disruptive behaviour. In the latter case, depression was

predicted by linear AEI, non-linear SEA though the interaction between the two was linear. Both interaction effects were small in magnitude: $f^2 = .01$ (Cohen, 1988). Table 2 displays the regression statistics.

Each effect was probed at conditional values (+1 and -1 *SD* above the mean) of EI (Figure 1). As figure 1A illustrates, the TEI x FD interaction was ordinal within the possible range of values of FD; the simple regression lines would cross at -15.16 *SD* below the (centred) mean of FD. Those with high emotional self-competency reported less disruptive behaviour at high levels of FD ($B = -.072, t = -4.612, p < .001$); in those with low emotional self-competency, this relationship was also significant though weakened ($B = -.072, t = -4.571, p < .001$). A disordinal pattern emerged with respect to AEI with the point of intersection occurring at 3.39, 1.74 standard deviations above the mean of SEA. Below this point (i.e., at low levels of SEA) high emotional ability was associated with fewer depressive symptoms ($B = -.386, t = -.728, p = .467$) relative to those with lower AEI ($B = -1.383, t = -2.735, p = .007$); however, beyond this (i.e. at very high levels of SEA) *higher* emotional skill was associated with *greater* depression ($B = -1.594, t = 3.5237, p = .001$) relative to those with lower levels of ability ($B = .601, t = 1.278, p = .202$). Notably, the point at which depression begins to increase occurs at lower levels of SEA as AEI increases (for high AEI = -1.19 below the mean; low AEI = .78 above the mean).

4. Discussion

This study has shown that pathways linking EI to better mental health are complex; whilst adolescents with higher self-perceived and actual emotional competency reported lower levels of

symptomatology in line with expected trends (e.g., Williams et al., 2009), it would seem that when faced with chronic stressors, EI may not be universally advantageous. Stressor-specific effects were found; EI failed to modify the effects of cumulative negative life events (indexed by major events *and* hassles) on health, which contrasts with Ciarrochi et al., (2002) but corroborates the null effects reported by Day et al., (2005). Moreover, effects were outcome specific; AEI amplified the relationship between exposure to economic deprivation and depression only, whilst TEI attenuated the effects of family dysfunction on disruptive behaviour only.

The AEI 'amplification' effect is consistent with the small body of existing adult-based research (Ciarrochi et al., 2002; Matthews et al., 2006) and also fits with the findings of Kraus, Cote, & Keltner (2010, study one), who reported that ability to perceive emotion in others was *poorer* in adults with *higher* socio-economic status. It has been suggested that within a 'risk context', chronically under-resourced with increased likelihood of exposure to uncontrollable stressors, individuals are more likely to be externally vs. internally focussed to maximise the detection of salient information from their environment (Kraus et al., 2010). Enhanced perception of emotional cues would be a logical corollary of this, however the current findings indicate that under conditions of high deprivation this could have harmful consequences for psychological wellbeing—here, being emotionally 'unintelligent' (i.e. less acutely aware of emotional cues, less knowledgeable of emotional consequences) appears advantageous. Nevertheless, the nature of the current analysis (i.e. total vs. branch level investigation) prevents identification of specific competencies underpinning this effect and remains something for future research to address. That said, high levels of total AEI *do* confer benefits up to a point (through conditions of relative affluence into moderate levels of adversity), hence programmes that target the teaching of these

abilities, e.g. Social and Emotional Aspects of Learning (Department for Education and Skills, 2007), could make a valuable contribution to the reduction of internalising disorder - particularly it would seem for oft-neglected, 'affluent' youth, who have been found to be at risk for increased depression, anxiety and substance abuse (Luthar & Latendresse, 2005).

Research suggests that up to 82% of daily stressors reported by adolescents are of an interpersonal nature (including problematic parental relationships) (Seiffge-Krenke, 2011) and family based variables (e.g., harsh/inconsistent discipline, conflict etc) have been most consistently implicated as mediators of the wider poverty-adjustment relationship (Grant et al., 2006). Hence, as a modifier of commonly occurring, proximal adolescent stressors the importance of fostering perceived emotional competency in youth appears similarly paramount, at least for interventions targeting behavioural disorders. Importantly this research extends the protective effects documented in adults for acute stressors (e.g., Mikolajczak et al., 2007), further strengthening the construct utility of EI.

Emotional personality and skill would appear to operate differentially in the stress process, however emergent research suggests these need not be mutually exclusive (e.g., Schutte, Malouff, & Hine, 2011); future work must investigate how skills influence competency to effect health outcomes in youth faced with adversity. Additionally, stressors do not act in isolation and both interactions, though significant, represented small effects. It remains equally plausible that both forms of EI could confer *indirect* effects on health outcomes by jointly influencing other personal

resources which are known to underscore pathways to adaptation, e.g., EI theory predicts links to coping which is a known mediator of stress-illness processes (Grant et al., 2006).

Despite the limitations of this research (i.e., correlational/cross-sectional, precluding causal inferences and the tracking of any developmental change in EI processes) it would seem that EI holds promise for further elucidating the dynamic interplay between markers of risk and protection operating in pathways to adjustment, and may offer a valid contribution to the prediction, understanding and attenuation of psychopathology in youth.

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Table 1
Correlations and descriptive statistics for EI, stressors and mental health variables

Variable	1	2	3	4	5	6	7
1. Depression	-						
2. Disruptive behaviour	.49**	-					
3. Socio-economic adversity	.04	.09*	-				
4. Negative life events	.14**	.16**	.06	-			
5. Family dysfunction	.38**	.35**	.06	.20**	-		
6. Trait EI	-.50**	-.33**	-.07	-.19**	-.41**	-	
7. Ability EI	-.12*	-.18**	-.06	-.22**	-.33**	.20**	-
<i>N</i>	402	402	405	405	398	390	405
Mean	10.71	6.72	3.94	34.56	22.98	133.16	92.16
(SD)	(9.13)	(6.15)	(1.95)	(38.35)	(5.92)	(20.28)	(15.16)
Range	0-38	0-28	0-9	0-188	12-40	62-203	54.54-126.58

Note EI = Emotional Intelligence. For interpretation purposes, standardised scores for ability EI (which have a mean of 100 and a standard deviation of 15) are presented.

* $p < 0.05$; ** $p < 0.01$

Table 2

The moderating effect of EI on the relationship between family dysfunction, socio-economic adversity and mental health

<i>Variable</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>R²</i>	<i>ΔR²</i>	<i>ΔF</i>
<i>Disruptive behaviour</i>						
<i>Step 1</i>				.022	.022	4.223*
Gender	-1.312	.627	.037			
Age	.562	.293	.056			
<i>Step 2</i>				.174	.153	34.644***
TEI	-.066	.016	.0001			
FD	.260	.054	.0001			
<i>Step 3</i>				.185	.011	4.846*
TEI x FD	-.005	.002	.028			
<i>Depression</i>						
<i>Step 1</i>				.014	.014	2.751
Gender	2.122	.909	.020			
Age	.144	.425	.735			
<i>Step 2</i>				.056	.042	5.883**
AEI	-5.808	1.981	.004			
SEA	.054	.232	.817			
SEA ²	.255	.097	.009			
<i>Step 3</i>				.066	.010	4.413*
AEI x SEA	2.098	.999	.036			

Note: TEI = trait emotional intelligence; FD = family dysfunction; AEI = ability emotional intelligence; SEA = socio-economic adversity. All predictor and control variables were standardised prior to analysis hence unstandardised beta coefficients are reported (Aiken & West, 1991).

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

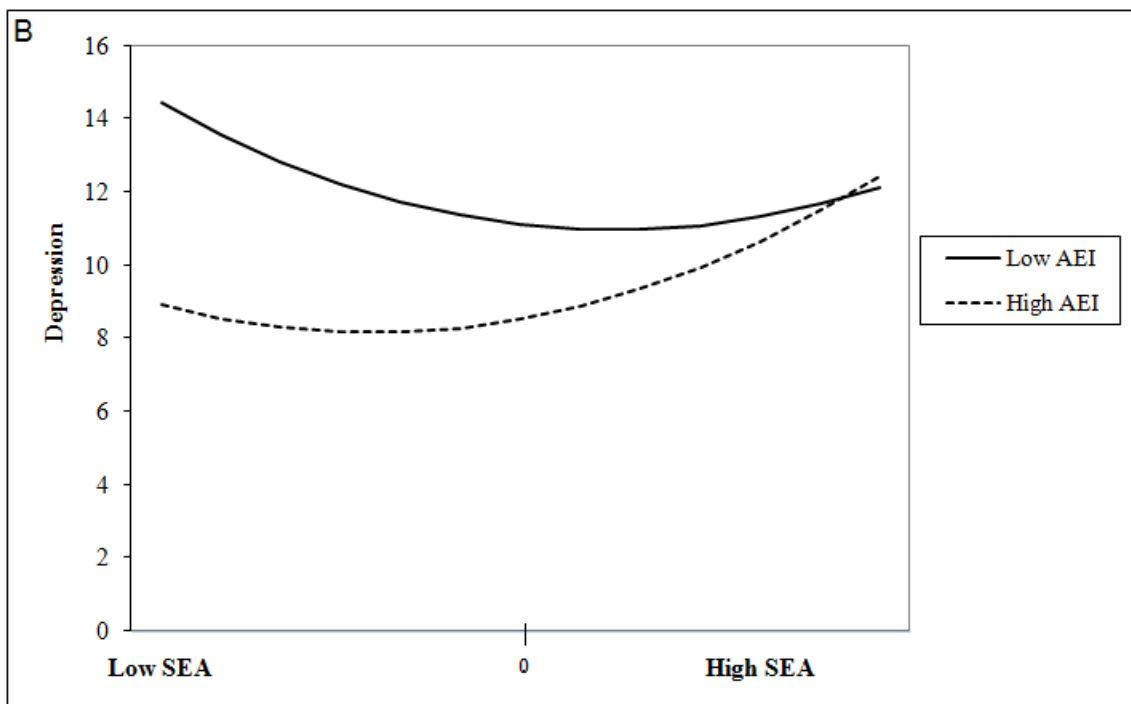
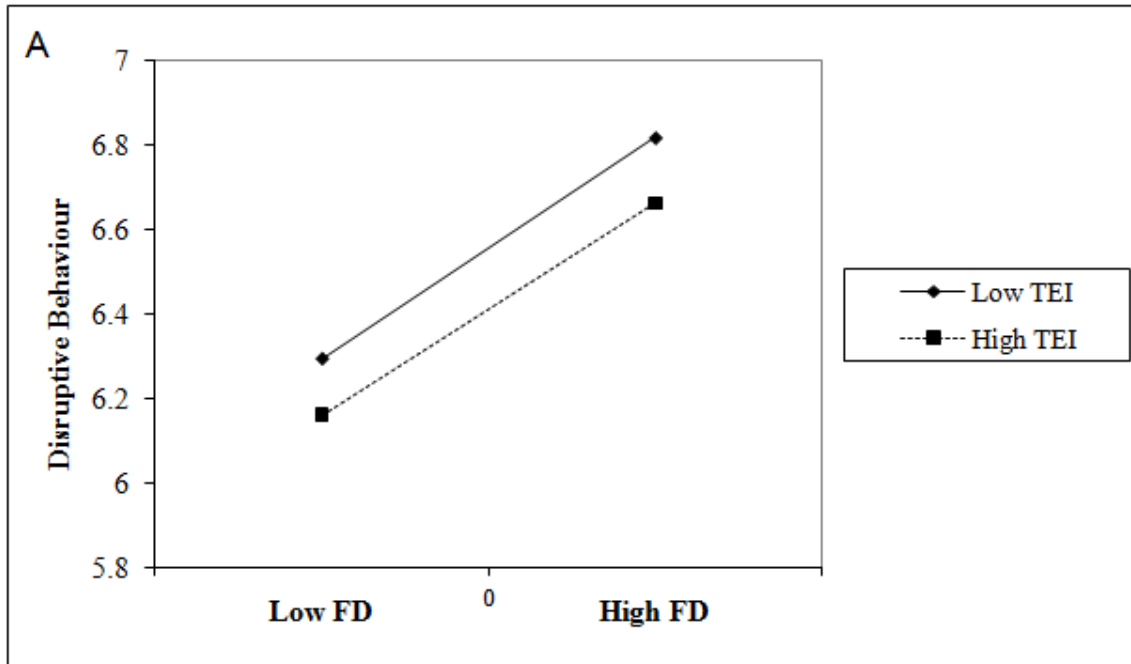


Figure 1 Data plots of the simple slope interactions for (A) trait emotional intelligence (TEI) x family dysfunction (FD) on disruptive behaviour and (B) ability emotional intelligence (AEI) x socio economic adversity (SEA) on depression