



Emotional intelligence predicts adolescent mental health beyond personality and cognitive ability

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ABSTRACT

Emotional intelligence (EI) has been reliably linked to better mental health (Martins, Ramalho, & Morin, 2010). However, critics have argued that EI may be conceptually redundant and unable to offer anything new to the prediction of key adaptational outcomes beyond known correlates of performance, i.e., personality and cognitive ability (Brody, 2004). Although sparse, extant evidence points to differential incremental contributions from ability and trait EI in the prediction of internalising vs. externalising symptomatology in adults (e.g., Gardner & Qualter, 2010; Rossen & Kranzler, 2009). However, there is a dearth of research addressing these associations in adolescents. The current study explored the incremental validity of ability and trait EI to predict depression and disruptive behaviour beyond the 'Big Five' personality dimensions and general cognitive ability in a sample of 499 adolescents (mean age 13.02 years). Regression analyses found that collectively, EI made a significant, incremental contribution to the prediction of disorder in youth. However, of the two, trait EI appears the stronger predictor. Findings are discussed with reference to EI theory and directions for future research.

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1. Introduction

Emotional intelligence (EI) captures individual differences in identifying, processing and regulating emotion (Zeidner, Matthews, & Roberts, 2009). EI is commonly sub-classified in line with two divergent methods of assessment; either considered a distinct group of mental abilities in emotional functioning tapped via measures of *maximal* performance, termed 'ability EI' (AEI), or, a cluster of emotion-related self-perceptions and dispositions accessed via self-reported *typical* performance, known as 'trait EI' (TEI) (Petrides, Pita, & Kokkinaki, 2007). This distinction has been corroborated empirically with negligible statistical associations reported between measures of AEI and TEI (e.g., Brackett & Mayer, 2003), and concurs with contemporary theorising which recognises the two approaches as complementary rather than mutually exclusive; importantly, declarative socio-emotional skill (AEI) may underpin but not necessarily translate into optimal 'on-line' functioning, which can be mutually influenced by implicit factors (e.g., self-efficacy: TEI) (Mikolajczak, 2009).

Conceived as a form of intelligence (Mayer, Caruso, & Salovey, 1999) AEI is moderately associated (ordinarily to the magnitude of $r \leq .4$) with measures of (crystallised) cognitive ability or proxies thereof, in both adult (e.g., Brackett & Mayer, 2003; Farrelly &

Austin, 2007) and youth samples (e.g., Peters, Kranzler, & Rossen, 2009). Conversely, relationships between AEI and measures of personality are typically negligible, with the most robust associations ($r \leq .3$) generally found for trait agreeableness and openness (e.g., Zeidner & Olnick-Shemesh, 2010). In contrast, conceived as a finer-grained personality trait(s) *some* facets of which are subsumed within traditional higher-order personality dimensions, TEI shares robust associations ($r \leq .5$ contingent upon measurement model) with broadband personality dimensions, particularly trait Neuroticism and Extraversion, whilst it is unrelated to cognitive ability in adults (Saklofske, Austin, & Minski, 2003) and youths (Ferrando et al., 2011; Mavroveli, Petrides, Shove, & Whitehead, 2008).

In light of links to allied variables, critics have argued that EI may be conceptually redundant and unable to offer anything new to the prediction of key outcome domains (Brody, 2004; Schulte, Ree, & Carretta, 2004). Thus, for many, advancement of the construct depends on whether a significant proportion of *incremental* and *unique* variance in adaptational outcomes can be attributed to EI beyond known predictors of performance (Fiori & Antonakis, 2011). Indeed, controlling for the established influence of personality would appear especially pertinent when exploring links between EI and mental health. Whilst proponents of EI claim that 'intelligent' utilisation of emotion-related skills and positive perceptions of competency to handle emotion-laden situations are imperative for successful adaptation (Mayer & Salovey, 1997; Petrides, Pita et al., 2007), there already exists a wealth of literature

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attesting to the prevalence of *qualitatively* similar patterns of ‘mal-adaptive’ higher-order personality traits across clinical disorders; for instance, a recent meta analysis found that high levels of Neuroticism (N) accompanied by low levels of Agreeableness (A), Extraversion (E), and Conscientiousness (C) distinguished clinical from comparison groups – a pattern which remained consistent, only varying *quantitatively*, across broadband categories of disorder, e.g., whereas internalising disorders shared significant negative effect sizes with E (lower levels), externalising disorders tended towards higher E, alongside lower N and A (Malouff, Thorsteinsson, & Schutte, 2005).

Although EI has been empirically associated with better mental health (Martins et al., 2010) few studies have statistically controlled for the influence of these conceptually-related variables in analyses. Moreover, available evidence would seem to point to differential incremental contributions from AEI and TEI in studies of adult mental health. With personality (i.e., ‘Big 5’ or ‘Eysenckian 3’) and general cognitive ability (i.e., measures of psychometric *g* or proxies such as academic attainment) held constant, AEI does *not* appear predictive of internalising symptomatology or positive affectivity e.g., *psychological distress*, *life satisfaction* (Karim & Weisz, 2010), *psychological wellbeing* (Rossen & Kranzler, 2009; Zeidner & Olnick-Shemesh, 2010) – although, with less stringent analysis (only personality controlled) AEI does contribute a small proportion of additional variance (1%; 4%) in the latter two variables (Extremera, Ruiz-Aranda, Pineda-Galán, & Salguero, 2011) and incrementally predicts ‘anxious thoughts’ (4%) (Bastian, Burns, & Nettelbeck, 2005). However, it would seem AEI may be better able to enhance prediction of disorders where externalising symptoms are a central feature; AEI significantly predicts reduced *alcohol use* (Brackett, Mayer, & Warner, 2004; Rossen & Kranzler, 2009), *illegal drug use* (Brackett et al., 2004) and *deviant behaviour* (Brackett & Mayer, 2003; Brackett et al., 2004) beyond both personality and cognitive ability – although the proportion of incremental variance explained by AEI is generally moderate (4–11%).

This trend appears reversed in adult TEI studies, where lower levels of perceived emotional competency appear more strongly related to mood disorders/indices of positive affect than externalising behaviours. For instance, with the effects of age, gender and personality held constant, three trait measures independently predicted incremental variance in *loneliness*, *hostility*, *happiness* and *life satisfaction* but not *aggression* (physical or verbal) or *anger* in adults (Gardner & Qualter, 2010), though markedly, the proportion of variance explained remained broadly consistent with the AEI research base (3–17%). Petrides, Perez-Gonzales & Furnham (2007) suggest this trend is consistent with TEI theory – disorders characterised by dispositional, internal emotionality (i.e., tapping negative affect) should be more robustly associated with TEI than disorders typified by context-specific, emotional displays.

1.1. The present study

Although these trends appear persuasive, the EI-mental health evidence base is undoubtedly limited by an almost exclusive focus upon adult populations. Those that *have* examined EI-mental health relationships in youth have disproportionately focussed upon examination of trait vs. ability associations in relation to internalising vs. externalising disorders. Moreover existing research hints at a more complex patterning of relationships in youth; in line with the adult trend, AEI appears unrelated to *depression* and *anxiety* (Williams, Daley, Burnside, & Hammond-Rowley, 2009) but is inversely associated with *number of school discipline referrals* (Peters et al., 2009) and *disruptive behaviour* (Williams et al., 2009). However, TEI appears similarly associated with indices of both internalising and externalising symptoms (Downey, Johnston, Hansen, Birney, & Stough, 2010; Siu, 2009). Moreover, crucially, researchers have so far neglected to

test whether EI (in either form) is still predictive of adolescent disorder in the presence of personality and cognitive ability. Patently, for an ‘adaptive’ account of EI to be fully realised, it must be consistently demonstrated that links found between EI and mental health in adulthood are similarly prevalent in younger populations and hold incrementally. Hence the current study makes a novel contribution to knowledge by exploring AEI/TEI relationships with youth depression and disruptive behaviour, including assessing whether any associations hold in the presence of higher order personality dimensions and general cognitive ability.

2. Methods

2.1. Participants

Five hundred and ten adolescents (270 females; 240 males) aged 11–16 years ($M = 13.02$, $SD = 1.08$) were recruited from five schools located in the West Midlands, UK, selected via opportunity sampling. Student participation was contingent on both parental consent and student assent.

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”) tapping *sociability* (e.g., managing others’ emotions; assertiveness) *emotionality* (e.g., emotional expression; perception of emotion in self/others); *self-control* (e.g., managing own emotions; impulsiveness) and *well-being* (e.g., optimism; happiness). Participants 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 robust psychometric properties (see 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) to represent 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 ($r = .42$

[perceiving] – .81 [managing]) and analyses were restricted to use of the total score representing the global AEI construct.

2.2.3. Personality

The Big Five Inventory-Adolescent Form (BFI-44-A; John, Donahue, & Kentle, 1991) consists of 44 short statements that tap prototypical traits considered central to the 'Big Five' taxonomy of higher-order individual differences in Neuroticism (N); Extraversion (E); Openness (O); Agreeableness (A) and Conscientiousness (C) (see John & Srivastava, 1999 for historical overview of the development of the 'Big Five'). Participants indicate the extent of their agreement with each statement (e.g., for Openness: "I see myself as someone who is creative and inventive") by means of a five-point scale: strongly disagree (1) to strongly agree (5). Computation of item averages yields dimensional scores (n items per dimension range from 8–10). Administering the BFI-44-A to 230,000 youth aged between 10–20 years, Soto, John, Gosling, and Potter (2008) reported adequate levels of internal consistency and a robust factor structure for the dimensions across development. In the present sample moderate alpha (α) values of .63 (E); .59 (A); .66 (C); .58 (N); .73 (O) were recovered, which concurs with the younger age groups described in Soto et al. (2008).

2.2.4. General cognitive ability

Key Stage 2 average points scores (APS) reflecting academic attainment in English, Maths and Science (assessed at age 11 via national testing) were collected from school records and used as a proxy measure for general cognitive ability (GCA). APS correspond to National Curriculum levels 1–8, with possible scores ranging from 3 to 58. Whilst the shortcomings of using proxy measures in place of standardised measures of psychometric g have been noted (Rossen & Kranzler, 2009), this was unavoidable given sampling constraints. As objective, nationally available data, APS represent a viable proxy and this approach has precedence in the construct validation literature (e.g., Brackett & Mayer, 2003).

2.2.5. 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).

2.3. Procedure

Students were given verbal and written instructions and completed questionnaire booklets (containing counterbalanced measures) individually within the whole-class setting. Class tutors and/or the researcher 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 1 h.

3. Results

Screening revealed eleven univariate outliers (detached from the distribution with z -scores ± 3.3 SD from the mean) which were subsequently removed (Tabachnick & Fidell, 2007), yielding

a revised sample N of 499. There were no multivariate outliers. Mental health variables were positively skewed. However, as the outcomes of main analyses were unchanged following log transformation, computations using the untransformed data are reported in the interests of clarity. Regression models did not appear to be affected by multicollinearity among predictors ($r < .9$; variance inflation factors < 1.7).

3.1. Preliminary analyses

Table 1 displays descriptive statistics for the study variables according to gender, and whole sample intercorrelations and descriptive statistics are presented in Table 2. Notably, females had significantly higher levels of emotional skills (AEI) and depression, whilst males reported higher levels of disruptive behaviour symptomatology. Age was associated with GCA ($r = .12$, $p < .05$), disruptive behaviour ($r = .11$, $p < .05$), and conscientiousness ($r = -.12$, $p < .05$). Subsequently, both age and gender effects were controlled in the main analysis. As described in Table 2, EI was inversely associated with symptomatology; TEI more robustly than AEI, and with depression rather than disruptive behaviour. Consistent with previous research, AEI and TEI were only weakly related, and whilst TEI was moderately associated with all personality dimensions, relations between AEI and the Big Five were weaker or non-significant. GCA was more strongly associated with AEI than TEI.

3.2. Incremental validity of EI to predict mental health

Four hierarchical regressions were conducted to assess the incremental contribution of AEI and TEI in predicting mental health beyond control variables, personality and GCA. Depression and disruptive behaviour scores were regressed, in turn, on gender and age (step 1), GCA (step 2), the Big Five personality dimensions (step 3) and EI (step 4). Table 3 presents regression statistics. Models predicting depression were significant (AEI: $F(9, 315) = 10.20$, $p < 0.001$; $R^2_{\text{adj}} = .20$; TEI: $F(9, 302) = 13.94$, $p < 0.001$; $R^2_{\text{adj}} = .27$) with both AEI and TEI contributing significantly on the final step (accounting for 1.2% and 8% of the variance in depression, respectively). Significant models for disruptive behaviour were also realised (AEI: $F(9, 315) = 9.09$, $p < 0.001$; $R^2_{\text{adj}} = .18$; TEI: $F(9, 302) = 9.05$, $p < 0.001$; $R^2_{\text{adj}} = .19$), with AEI (1.2%) and TEI (1.8%) each making significant incremental contributions.

4. Discussion

Findings from the current study support the construct differentiation and complementary theoretical conceptualisations of trait and ability EI. Within a large sample of adolescents, the two measures of EI were only weakly associated and each showed the expected patterning of associations with personality dimensions (to which TEI was more robustly associated than AEI) and GCA (to which AEI was more strongly linked than TEI), which is fully in line with recent research (Mavroveli et al., 2008; Peters et al., 2009; Saklofske et al., 2003; Zeidner & Olnick-Shemesh, 2010). Crucially, in spite of these associations, it would appear that both forms of EI can make a significant, incremental contribution to the prediction of mental health in adolescence, thus challenging critics in the field (e.g., Brody, 2004).

Concordant with established literature (e.g., Malouff et al., 2005), the big five dimensions accounted for the largest proportion of variance in depression ($\Delta R^2 = .18$) and disruptive behaviour ($\Delta R^2 = .15$), with trait Neuroticism and Agreeableness particularly influential, whilst contributions from GCA were much smaller (adding 1.7% to the prediction of depression; n.s. with disruptive

Table 1
Descriptive statistics for EI, mental health and control variables, by gender.

Variables	Males		Females		<i>t</i>	<i>d</i>
	<i>M</i> (<i>SD</i>)	Range	<i>M</i> (<i>SD</i>)	Range		
1. Emotional intelligence (EI)						
Ability EI	88.53 (15.51)	54.54–120.87	96.72 (13.08)	61.80–126.58	–6.34***	.57
Trait EI	131.79 (18.94)	88.00–188	132.68 (21.45)	78.00 – 203.00	–.46	.04
2. Personality						
Neuroticism	2.69 (.53)	1.00–4.13	2.88 (.63)	1.00 – 4.88	–3.41**	.33
Extraversion	3.31 (.61)	1.38–4.88	3.42 (.64)	1.75–5.00	–1.88	.18
Openness	3.45 (.62)	1.40–4.90	3.60 (.63)	1.80–5.00	–2.56*	.24
Conscientiousness	3.24 (.58)	1.56–5.00	3.39 (.62)	2.11–5.00	–2.54*	.25
Agreeableness	3.41 (.58)	1.75–5.00	3.64 (.59)	2.38–5.00	–4.08***	.39
3. General cognitive ability						
KS2 average points score	30.06 (3.35)	20.70–37.00	30.64 (3.10)	17.60 – 36.10	–1.67	.18
4. Mental health						
Depression	9.59 (8.43)	0–38.00	11.36 (9.42)	0–43.00	–2.20*	.20
Disruptive behaviour	7.65 (6.44)	0–31.00	5.95 (5.93)	0–26.00	3.05**	.27

Note: Male *ns* varied from 178 to 233; female *ns* varied from 171 to 266. Standardised scores for ability EI (*M* = 100; *SD* = 15) are presented. Effect sizes (*d*) correspond to tests of mean difference (*t*); values of 0.2, 0.5, and 0.8 represent small, medium, and large effects, respectively (Cohen, 1988).

* *p* < 0.05.

** *p* < 0.01.

*** *p* < 0.001.

Table 2
Whole-sample correlations and descriptive statistics for EI, mental health and control variables.

Variable	1	2	3	4	5	6	7	8	9	10
1. Depression	–									
2. Disruptive behaviour	.50***	–								
3. Neuroticism	.44***	.22***	–							
4. Extraversion	–.18**	–.05	–.30***	–						
5. Openness	–.06	–.06	–.13**	.43***	–					
6. Conscientiousness	–.16**	–.26***	–.32***	.21**	.38***	–				
7. Agreeableness	–.22***	–.39***	–.33***	.18**	.35***	.52***	–			
8. General cognitive ability	–.11*	–.09	–.05	.22**	.35***	.10	.21***	–		
9. Trait emotional intelligence	–.47***	–.29***	–.51***	.35***	.33***	.42***	.38***	.22***	–	
10. Ability emotional intelligence	–.13**	–.19***	–.03	.12*	.40***	.20***	.27***	.47***	.20***	–
<i>N</i>	494	494	445	445	445	445	445	349	441	499
Mean(<i>SD</i>)	10.54(9.01)	6.74(6.23)	2.79(.59)	3.37(.63)	3.53(.63)	3.32(.61)	3.53(.60)	30.35(3.24)	132.26(20.29)	92.91(14.84)
Range	0–48.00	0–31.00	1–4.88	1.38–5.00	1.40–5.00	1.56–5.00	1.75–5.00	17.60–37.00	78–203	54.54–126.58

Note: Standardised scores for ability emotional intelligence (*M* = 100; *SD* = 15) are presented.

* *p* < 0.05.

** *p* < 0.01.

*** *p* < 0.001.

behaviour). Beyond these influences, it would appear that although both were significant predictors, *perceived* emotional self-competency vs. *actual* emotional skill accounts for more unique variance in disorder (semi-partial *r* TEI-depression = $-.28$ and TEI-disruptive behaviour $r = -.13$ vs. AEI, both $rs = -.11$), particularly depression, which represented a small to medium effect. Nonetheless, it has been suggested that since focal variables within social science measurement models are often inherently related, any semi-partial correlation in the range of $.15$ – $.20$ on the *third* step of a regression can be considered meaningful (Hunsley & Meyer, 2003). Thus, given the stringent nature of the current analysis (i.e., multiple control variables), the smaller incremental contributions from AEI also represent important influences in the prediction of adaptation.

It is also possible that common method variance (i.e., Likert scale response format; single-respondent; single-occasion) artificially inflated TEI-outcome relationships. However, post hoc exploration of personality, TEI and health variables using Harman's single-factor test (Podsakoff & Organ, 1986) identified multiple factors. This, coupled with the small amount of variance accounted for by the first factor (13%), indicates that analyses were not unduly

affected by bias arising from shared methodology. Moreover, recent work suggests that TEI-mental health associations are robust against socially desirable responding (Choi, Klumper, & Sauley, 2011) and criterion contamination (Williams, Daley, Burnside, & Hammond-Rowley, 2010).

Current findings extend the embryonic EI-mental health evidence base; concurring with existing adolescent-based research, TEI was found to be a common predictor of internalising and externalising disorder (Downey et al., 2010), which contrasts with adult TEI trends, although the proportion of incremental variance explained accords with adult studies of internalising symptomatology (e.g., Gardner & Qualter, 2010). Importantly, despite being partially determined by personality (particularly trait Neuroticism) and the fact that internalising disorders are linked via negative affect, the unique variance captured by TEI ensures the construct remains a valuable explanatory and incremental predictor of such disorders (Petrides, Pita et al., 2007). The utility of AEI to predict both behavioural and mood disorder contrasts with both adult (e.g., Rossen & Kranzler, 2009) and youth studies to date (e.g., Williams et al., 2009). However, this study is the first to assess relations using an

Table 3
Hierarchical regression of mental health on gender, age, general cognitive ability (GCA), personality and emotional intelligence (EI).

Variable	Disruptive behaviour						Depression					
	β	SE	t	R ²	ΔR^2	ΔF	β	SE	t	R ²	ΔR^2	ΔF
Step 1				.03	.03	4.96**				.01	.01	2.08
Gender	-.13	.69	-2.42*				.11	1.00	2.04*			
Age	.11	.32	1.94				.06	.46	.94			
Step 2				.04	.01	2.50				.03	.02	5.46*
GCA	-.09	.11	-1.58				-.13	.16	-2.34*			
Step 3				.20	.16	12.35***				.21	.18	14.82***
Extraversion	.02	.59	.31				-.07	.84	-1.15			
Agreeableness	-.33	.66	-5.22***				-.11	.95	-1.69			
Conscientiousness	-.08	.65	-1.24				.01	.92	.13			
Neuroticism	.18	.62	2.00*				.38	.88	6.53***			
Openness	.12	.63	1.87				.07	.90	1.18			
Step 4				.21	.01	4.57*				.23	.01	4.93*
Ability EI	-.13	1.67	-2.14*				-.14	2.38	-2.22*			
Step 4				.21	.02	6.78**				.29	.08	34.17***
Trait EI	-.17	.02	-2.60**				-.37	.03	-5.85***			

Note: For each model, variables across steps 1–3 remain the same and variables on step 4 change (i.e., type of EI) hence, results for steps 1–3 are presented for each outcome only once.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

omnibus AEI instrument (MSCEIT-YVR) alongside clinical outcome measures (vs. discrete measures of social ‘maladaptation’, e.g., number of physical fights).

Whilst the current findings are limited by aspects of the research design (i.e., cross-sectional; correlational; use of a proxy measure of g), they hold much promise for future explorations of links between EI and adolescent mental health. With basic predictive and incremental associations established, and prevention research suggesting that EI skills can be fostered via school-based programmes (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011), relationships must now be examined prospectively, via longitudinal designs, with reference to a greater range of disorders. Research exploring the underlying processes underpinning these relationships is also needed to determine *how* (whether directly or indirectly linked to known stress-illness processes) and *when* (within which context) EI influences adaptation (Zeidner et al., 2009). Though some progress has been made in this regard (e.g., Davis & Humphrey, 2011; Downey et al., 2010) much remains to be done to fully elucidate the role of EI in pathways to adaptation.

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