

The Relationship of Trait EI with Personality, IQ and Sex in a UK Sample of Employees

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The relationships among trait emotional intelligence (EI), personality, IQ and sex were investigated in a sample of 585 employees (478 males, 107 females). Participants completed the Watson–Glaser Critical Thinking Appraisal, the Bar-On Quotient Inventory (EQ-i) and the Neuroticism–Extraversion–Openness Personality Inventory Revised. Bivariate correlations revealed significant associations between overall EQ-i and Neuroticism (negative), Agreeableness, Extraversion, Openness and Conscientiousness (all positive). While there were no significant associations between overall EQ-i and sex or IQ, significant correlations were observed when EI components were considered. Male participants scored significantly higher on Adaptability and females scored significantly higher on the Interpersonal facet. Moreover, IQ correlated with the Interpersonal composite in the male sample. Results are discussed in the context of trait EI structure and its implications for interpretation of sex and IQ effects.

I. Introduction

Despite the considerable amount of recent research on trait emotional intelligence (EI) (Mikolajczak, Menil, & Luminet, 2007), defined broadly as emotional self-efficacy or people's perceptions of their ability to perceive and manage their own and others' emotions (Sevdalis, Petrides, & Harvey, 2007), several questions remain unanswered. The first concerns the dimensionality of trait EI measures, which has been replicated in some inventories (Petrides & Furnham, 2000a), but remains disputed in others. The second issue is the use of EI in 'high-stakes' contexts, where self-reports of EI have shown a substantial overlap with personality traits (Sjoberg, 2001; Sjoberg & Engelberg, 2004). For instance, research on the Bar-On Emotional

Quotient Inventory (Bar EQ-i), one of the most widely marketed self-report EI measures (Bar On, 1997) has yet to be consistently linked with established personality and cognitive ability constructs. Moreover, a third central issue in regards to trait EI research is the role of sex. Although there has been evidence for sex differences in favour of women, such studies have looked at 'ability' EI, which measures some of the characteristics of EI via objective performance tests or vignettes rather than self-reports (and correlated with self-reports in the range of $r = .15-.45$, Petrides & Furnham, 2000b). However, researchers have largely failed to confirm women's superiority on overall self-reports of EI (Bastian, Burns, & Nettelbeck, 2005; Bar On, Brown, Kirkaldy, & Thorne, 2000; Saklofske, Austin, Galloway, & Davidson, 2007).

Thus, the current study aims to examine the taxonomic position of EI as measured by the Bar On (1997) in relation to the Big Five personality traits in a 'high-stakes' context. In particular, it intended to test the extent to which overall EI as well as its different composite facets relate to different big five factors. Moreover, it attempted to investigate sex effects on overall and EI sub-factors.

2. Method

2.1. Participants

In total 585 (478 males; 107 females) participants were drawn from a UK private organization [Mean age = 43.91 ($SD = 7.90$)] years. Over two-thirds (370) were senior managers in the sense that they managed managers; while just over a quarter (164) were only managers. The remaining participants were specialists.

2.2. Measures

IQ. Watson–Glaser Critical Thinking Appraisal. This is a test of crystallized intelligence (verbal reasoning) and comprises five sub-tests (Inference-Discriminating; Recognition of Assumptions; Deduction; Interpretation, and Evaluation of Arguments) that address the theoretical concept of critical thinking and issues of practical applications (Watson & Glaser, 1994).

The Bar On EQ-I (Bar On, 1997). Consists of 133 items and assesses five higher-order factors (Intrapersonal, Interpersonal, Adaptability, Mood and Stress Management) and 15 low-order sub-scales.

The Neuroticism–Extraversion–Openness Personality Inventory Revised (NEO-PI-R; Costa & McCrae, 1992) comprises 240 items (five-point Likert-type scale) designed to assess five personality traits, namely Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness (for reliability and validity evidence see Chamorro-Premuzic & Furnham, 2005; Costa & McCrae, 1992).

2.3. Procedure

Participants were recruited from a middle management assessment centre, where they were required to complete these questionnaires among other exercises as part of their selection process. A trained and certified assessor gave each manager feedback on the results of the questionnaires.

3. Results

3.1. EI Structure

A confirmatory factor analysis using AMOS 5.0 (Arbuckle, 2003) was computed to examine the fit of

a five-factor model (Bar On, 1997). The results revealed a non-fitting model, with most indices (except for the $PGFI = .50$) out of the expected range: $\chi^2(90) = 2358.57$ highly significant ($p < .001$); $CFI = .56$ and $AGFI = .56$ (below the expected = .90) and $RMSEA = .20$ (confidence interval .20, .21) (exceeding the .08 norm).

Therefore, an exploratory factor analysis using PCA and Varimax rotation was performed to investigate a more appropriate structure of the Bar On inventory. Inspection of the scree test suggested a four-factor structure, as opposed to the original five higher factors proposed by Bar On (1997). The four underlying components were easily interpretable and labelled as follows: (1) Mood (M; eigenvalue = 6.24, explained variance = 42.79%); (2) Intrapersonal (IA; eigenvalue = 1.61, explained variance = 10.77%); (3) Interpersonal (IE; eigenvalue = 1.47; explained variance = 9.82%); and (4) Adaptability (AD; eigenvalue = 1.03; explained variance = 6.87%). Because of the high intercorrelation among the factors (range from $r = .33$ to .67) a single score was also computed and labelled 'EI-T'.

3.2. Correlates and predictors of EI across sexes

Positive associations were found between EI-T and Extraversion, Conscientiousness, Openness and Agreeableness, whereas a negative association was found between EI-T and Neuroticism. Conversely, there were no significant associations between EI-T and sex or between EI-T and IQ. However, significant correlations were observed between two of EI components (AD and IE) and sex, with male participants scoring significantly higher on AD and females scoring significantly higher on IE (see Table 1 for descriptives and r coefficients).

In order to explore sex differences in EI and personality, correlations were also performed independently for males and females (see Table 2). Results revealed few differences across sexes. For instance, for males seniority level negatively correlated with EI-T, IA and M, while for women seniority was not a significant correlate of EI. Moreover, IQ was only a significant correlate on the male sample as well as Agreeableness significantly correlated with EI-T, IE and AD only for males. Finally, in the male sample, when the correlations between seniority level and EI were partialled out by IQ, the associations between seniority level and EI-T, IA and M were no longer significant.

Next, a series of hierarchical regressions were computed to test the degree to which IQ (Block 1), sex (Block 2), the interaction sex \times IQ (Block 3) and personality factors (Block 4) predict EI-T and EI components. As expected, personality traits were the strongest, and in three out of the four models, only

Table 1. Descriptives and Bivariate correlations among all variables

Measure [α ; M(SD)]	2	3	4	5	6	7	8	9	10	11	12	13	14
1 S	-.21**	.19**	.04	.10*	.12**	.10**	.08	-.07	.05	.17**	-.20**	.02	.05
2 Age		-.35**	-.21**	-.10*	-.16**	-.12**	.11*	.06	.02	-.09	.07	-.01	.01
3 SN			.08*	.18**	-.09*	.04	.01	-.02	-.21**	.05	-.06	-.13*	-.10
4 IQ [M = 50.13(28.67)]				-.01	-.01	.02	.01	-.11**	-.02	-.10	-.05	-.01	-.06
5 N [α = .84; M = 61.77(20.54)]					-.38**	-.11**	-.15**	-.40**	-.59**	-.17**	-.39**	-.45**	-.49**
6 E [α = .80; M = 129.57(19.31)]						.45**	.01	.25*	-.50**	-.51**	-.02	.51**	.52**
7 O [α = .75; M = 120.86(18.96)]							.06	-.05	.33**	.43**	-.10	.20**	.32**
8 A [α = .68; M = 120.62(15.01)]								.13**	-.03	.30**	.21**	.02	.16**
9 C [α = .81; M = 135.20(16.94)]									.33**	.24**	.53**	.27**	.41**
10 IA [α = .83; M = 106.00(9.54)]										.47**	.44**	.67**	.83**
11 IE [α = .81; M = 97.17(10.61)]											.33**	.55**	.79**
12 AD [α = .67; M = 76.67(6.20)]												.46**	.64**
13 M [α = .84; M = 103.60(9.32)]													.86**
14 T [α = .89; M = 102.60(7.55)]													

Note: N range from 307 to 585. * $p < .05$; ** $p < .01$. S, Sex; SN, Seniority; N, Neuroticism; E, Extraversion; O, Openness; A, Agreeableness; C, Conscientiousness; T, Emotional Intelligence Total; IA, Intrapersonal; IE, Interpersonal; AD, Adapt; M, Mood.

Table 2. Bivariate correlations among all variable, for males (upper matrix) and females (lower matrix)

	1	2	3	4	5	6	7	8	9	10	11	12
1 EI-T	1	.83**	.81**	.65**	.86**	-.16*	-.10	-.50**	.54**	.33**	.17**	.39**
2 IA	.81**	1	.51**	.45**	.66**	-.27**	-.04	-.58**	.54**	.32**	.01	.31**
3 IE	.72**	.29*	1	.37**	.58**	-.01	-.15*	-.21**	.51**	.45**	.29**	.26**
4 AD	.74**	.53**	.41**	1	.47**	-.07	-.06	-.40**	.01	-.08	.24**	.50**
5 M	.86**	.72**	.45**	.52**	1	-.15*	-.04	-.44**	.53**	.21**	.04	.25**
6 SN	.07	-.01	.17	.12	-.06	1	.11*	.17**	-.14**	.03	-.04	-.03
7 IQ	.08	.01	.09	.02	.11	.04	1	-.01	-.02	.03	.02	-.17**
8 N	-.49**	-.64**	-.07	-.36**	-.49**	.13	.04	1	-.41**	-.12**	-.21**	-.40**
9 E	.41**	.31*	.42**	.03	.45**	-.01	-.04	-.36**	1	.48**	-.01	.29**
10 O	.26*	.37**	.18	.03	.17	-.02	-.03	-.14	.29**	1	.08	-.02
11 A	.08	-.23	.38**	.15	-.05	.10	-.17	.04	.08	-.08	1	.16**
12 C	.52**	.43**	.23	.63**	.42**	.10	.15	-.41**	.08	-.17	.01	1

Note: * $p < .05$; ** $p < .01$. EI-T, Emotional Intelligence Total; IA, Intrapersonal; IE, Interpersonal; AD, Adaptability; M, Mood; SN, Seniority; N, Neuroticism; E, Extraversion; O, Openness; A, Agreeableness; C, Conscientiousness.

significant predictors of EI. As shown in Table 3, for EI total, the entered variables accounted for 44% of the variance and Neuroticism was the strongest predictor. With regard to EI components, the explained variance ranged from 33% (M) to 49% (IA) and the major predictors were Neuroticism (IA) Extraversion (IE and M) and Conscientiousness (AD). Interestingly, sex was only a significant predictor of AD. Regression analyses were also performed independently for males and females, with IQ (Block 1) and personality factors (Block 2) as predictors (see Table 3).

4. Discussion

In line with previous research (Bar On et al., 2000; Palmer, Manocha, Gignac, & Stough, 2003) our findings failed to support the five-dimensional structure of the Bar EQ-i. Precisely, PCA revealed a four-factor underlying structure. However, the retained four factors

showed high internal reliability and were easily interpretable as Mood, Intrapersonal, Interpersonal and Adaptability, in line with Bar On (1997). Moreover, intercorrelations supported a higher-order factor in self-assessed EQ-i, as claimed by several researchers (Bar On, 1997; Palmer et al., 2003).

On the other hand, correlations between EQ-i composites and personality suggest that EQ-i factors do reflect different aspects of self-assessed emotional ability. In the current sample, particularly Agreeableness and Extraversion did not show a consistent pattern of correlations across the composites. The former correlated significantly only with IE and AD, whereas the latter correlated negatively with IA and IE, but positively correlated with M. Furthermore, in line with previous studies (see Bar On, 1997; Derksen, Kramer, & Datzko, 2002; Hemmati, Mills, & Kroner, 2004) self-assessed EQ-i did not show significant correlations with IQ. This result as well as the high correlations between personality and EQ-i (supporting Bastian et al., 2005

Table 3. IQ, sex and personality as predictors of emotional intelligence

	EI-T		IA		IE		AD		M	
	β	<i>t</i>	β	<i>t</i>	β	<i>t</i>	β	<i>t</i>	β	<i>t</i>
IQ										
T	-.16	1.54	-.02	.19	-.32	2.92**	-.06	.53	-.04	.40
M	-.06	1.31	-.01	.11	-.12	2.52*	.03	.55	-.01	.26
F	.04	.44	-.02	.28	.07	.63	-.02	.25	.10	.96
Sex										
T	-.14	1.41	.02	.20	-.17	1.68	-.16	1.54	-.09	.86
IQ \times sex										
T	.18	1.28	.02	.15	.34	2.33	.05	.34	.08	.55
N										
T	-.27	5.31**	-.46	9.61**	.09	1.74	-.27	5.03**	-.27	4.98**
M	-.27	4.77**	-.45	8.41**	.08	1.40	-.30	4.88**	-.26	4.31**
F	-.22	1.69	-.44	3.65**	-.11	.75	-.11	.79	-.27	1.90
E										
T	.30	5.58**	.21	4.23**	.38	6.96**	-.19	3.40**	.39	6.78**
M	.31	5.09**	.25	4.42**	.37	5.91**	-.20	3.11**	.41	6.26**
F	.22	2.07*	.06	.65	.35	2.85**	-.12	1.04	.31	2.67*
O										
T	.18	3.64**	.21	4.54**	.24	4.80**	.02	.43	.01	.34
M	.16	2.86**	.18	3.35**	.26	4.48**	.01	.01	-.01	.05
F	.26	2.47**	.31	3.28**	.21	1.78	.17	1.57	.10	.87
A										
T	.04	.97	-.16	4.00**	.26	5.74**	.09	2.06*	-.05	1.19
M	.04	.87	-.15	3.19**	.24	4.72**	.09	1.74	-.04	.82
F	.05	.55	-.20	2.24*	.34	3.03**	.09	.91	-.07	.68
C										
T	.22	4.53**	.12	2.68**	.16	3.30**	.40	7.64**	.08	1.52
M	.19	3.55**	.10	2.00*	.15	2.77**	.39	6.61**	.04	.75
F	.37	2.89**	.23	1.95	.23	1.56	.57	4.13**	.24	1.71
F(8, 297)										
T	31.43**		38.86**		27.93**		23.01**		20.52**	
F(6, 241)										
M	33.13**		40.51**		29.09**		21.24**		21.58**	
F(6, 52)										
F	8.43**		12.20**		4.82**		6.48**		6.32**	
Adjusted R²										
T	.44		.49		.41		.36		.33	
M	.43		.49		.40		.33		.33	
F	.49		.53		.28		.36		.35	

Note: *** $p < .001$; ** $p < .01$; * $p < .05$. N, Neuroticism; E, Extraversion; O, Openness; A, Agreeableness; C, Conscientiousness; IA, Intrapersonal; IE, Interpersonal; AD, Adaptability; M, Mood.

findings) confirmed self-assessed EQ-i as a trait measure of EQ-i rather than an ability measure of EQ-i. Personality factors were the only significant predictors of EQ-i in four out of the five regression models and the explained variance accounted for ranged from 28% to 53%. Supporting previous findings (Newsome, Day, & Catano, 2000) this study confirmed the strong negative correlation between EQ-i and Neuroticism. That said, it is important to emphasize that a substantial amount of variance in the EQ-i remains unexplained by personality traits. Thus self-reports of EI and personality traits are best regarded as related-but-different constructs.

When sex was considered, a different pattern of interaction between IQ and EQ-i emerged. For women, lower IQ returns lower EQ-i, while for men, lower IQ

corresponds to higher EQ-i. This pattern of results is arguably stronger because of the IE composite, where IQ was a negative correlate in the male sample. However, even when not significant, IQ was always negatively correlated with EQ-i in the male sample. One possibility is that, for males, the abilities comprised by the EQ-i may have compensatory effects for lower cognitive ability. Thus, males with low cognitive abilities would maximize their interpersonal skills (a more malleable construct than IQ) in order to achieve higher performance.

Nevertheless, it is also worthwhile to consider that in higher stake scenarios the above negative association may not hold. There is considerable evidence that social desirability affects personality assessments on high-stake settings (Mesmer-Magnus, Viswesvaran,

Deshpande, & Joseph, 2006) and the same pattern is expected for EI. Thus, in personal selection situations, for example, higher IQ males may also rate themselves higher on EI, changing the pattern of association between the two variables.

Moreover, in line with similar studies (Bar On *et al.*, 2000; Dawda & Hart, 2000) examination of the four EQ-i components revealed significant sex differences in AD and IE, though in opposite directions; thereby sex differences in EQ-i-T were attenuated. For instance, males rated themselves higher on the ability to resist or delay impulse, drive or temptation to act; on the ability to identify and define problems; and on the ability to assess the correspondence between what is experienced and what objectively exists. Conversely, women were found to have higher scores on the ability to recognize one's feelings; the ability to be aware of, to understand, and to appreciate the feelings of others; the ability to demonstrate oneself as a cooperative, contributing, and constructive member of one's social group and the ability to establish and maintain mutually satisfying relationships.

Research on EQ-i has shown that women not only self-rate their EI higher than men (Furnham & Buchanan, 2005; Petrides, Furnham, & Martin, 2004), but that they also outperform men in ability measures of EQ-I (Petrides & Furnham, 2000b). Conversely, sex differences on AD do not return males' performance on ability measures of EQ-I, but would reflect the over-estimation bias in self-report measures of intelligence found in male samples (Furnham & Rawles, 1995).

Sex differences were also found when seniority level was taken into account. For males, the higher the achieved position, the lower the EQ-i-T, EQ-IA and EQ-i-M scores, whereas for women, seniority was not a significant correlate. One possible explanation is that a larger number of males had a Manager of managers' position, whereas females were spread into Manager of managers and Supervisor's positions. However, it is worth considering the positive significant correlation between IQ-seniority as well as the fact that, for males, the IQ-EQ association was always negative, whereas for women, apart from IA, this relation was consistently positive, but much weaker than in the male' sample. Thus, it is possible that for men, EI would correlate negatively with higher seniority levels only because men who are low in EQ-i are high in IQ. On the other hand, as IQ was not significantly correlated with EQ-i in the female sample, there were no significant correlations between EQ-i and seniority.

Some caution is required when interpreting sex effects on overall estimates of EQ-i. We suggest that composites scores of EQ-i should always be considered. Further research that overcomes the present study's limitations, such as a restricted sample and absence of trait EQ-i and verbal IQ measures is also

encouraged. The current study adds support to the conceptualization of EI as a higher-order personality construct, largely, but not fully explained by the Big Five and unrelated to cognitive ability. Previous studies on personality and EI found similar trends of overlap between these constructs even when assessed in low-stake settings. Further, given the increased interest to assess EI in the context of personality selection, data from high-stake settings make an important contribution to the literature.

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