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Are EQ and IQ Negatively Related? The Relationship between Trait Emotional Intelligence and Fluid Cognitive Ability

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Abstract

There has long been an interest in the relationship between EQ and IQ. In this study, over 6000 adults completed both a multidimensional, well-validated Intelligence (IQ) test (GIA) with five subscales (*Reasoning*, *Perceptual Speed*, *Number Speed & Accuracy*, *Word Meaning*, and *Spatial Visualization*) as well as a well-established measure of Trait Emotional Intelligence (TEIQue) with 15 subscales. Nearly, all correlations between these measures were very small, significant ($-.07 < r < -.12$) and negative. An exploratory factor analysis of both measures combined confirmed the four-factor structure of the TEIQue measure and the single-factor structure of the IQ tests. Structural Equation Modelling showed the IQ scores of reasoning and word meaning to be most closely related to TEIQue dimensions. We considered and discussed the implications and limitations of these findings.

Keywords

Emotional Intelligence, Fluid Intelligence, Reasoning, Academic Success

1. Introduction

Over recent years, several studies have examined the relationship between personality and intelligence (Ackerman, 2018; Bédard & Le Corff, 2020; Cuppello et al., 2023; Furnham & Robinson, 2023; Stankov, 2018). While different measures of both variables have been used, and very different population groups (age, sex, education) have been studied, the results have been generally similar (Rammstedt et al., 2018). The meta-analyses have found that three of the Big Five personality factors are very modestly related to intelligence: Neuroticism and Conscien-

tiousness negatively, and Openness positively. Some authors have provided explanations for these results (Chamorro-Premuzic et al., 2004; Cuppello et al., 2023).

Within the extensive rise in the literature on emotional intelligence, two contrasting approaches have emerged, focusing on emotional intelligence as either a measurable *ability* (AEI) or a *self-reported* trait (TEI). TEI is presumed to be represented by behavioral dispositions and self-perceptions of one's ability to recognize and understand emotions (Petrides, 2011; Petrides & Furnham, 2001, 2003; Petrides et al., 2016). This is essentially the difference between maximal and typical performance, measured by timed and untimed tests.

In this study, we were concerned with a typical/self-report measure of emotional intelligence (EQ), the Trait Emotional Intelligence Questionnaire (TEiQ: Petrides, 2009; Andrei et al., 2016) and a new five-dimension measure of fluid intelligence (GIA: Dann, 2015). Both measures are psychometrically robust (Furnham & Treglown, 2018). We used a large population of middle-aged adults in this study, a population neglected in many previous studies. We studied the relationship between cognitive intelligence (i.e. the "g" domain of intelligence at the facet level) and Trait Emotional Intelligence (TEI). There has been a long interest in the relationship between these two concepts, although early researchers of TEI never predicted a relationship between it and mental intelligence (Furnham & Robinson, 2023; Petrides & Furnham, 2003). It has been demonstrated that each variable (EQ and IQ) accounts for unique variance in explaining a variety of outcomes, particularly at work (Treglown & Furnham, 2022; Treglown et al., 2021).

As noted above, many studies have used different measures and population groups to explore this relationship, though some have used AEI and other TEI (Olderbak et al., 2018). For instance, in a study of 188 German students, Völker (2020) showed that EQ ability (AEI) was related more to crystalised (Gc) than fluid (Gf) intelligence and that recognizing and understanding emotions (TEI) also related most clearly to fluid and crystallized abilities.

Prior empirical work in this field would suggest that trait EQ or TEI is more robustly related to, but distinct from, personality, as measured by the Big Five personality factors (Petrides & Furnham, 2001; Treglown et al., 2021) and is quite different from ability EQ or AEI (Petrides et al., 2007). Some have viewed trait EQ as an individual difference construct, and therefore argued that EQ exists within the same "space" as personality (a preference, not a power variable), accounting for very little criterion variance above and beyond that of basic personality dimensions (Matthews et al., 2002). Petrides et al. (2007), however, found evidence to suggest that EQ is a distinct construct, partially because it is determined by a number of personality factors and that it "exists at the lower levels of personality hierarchies" (p. 48), thus somewhat dispelling the myth that EQ is simply Big Five personality "rebranded".

There have been many studies on the relationship between EQ and conventional cognitive ability/intelligence (IQ). These studies have differed in measures of both EQ and IQ, the population tested, and what other variables were used as

moderators, mediators, or criterion variables. Hence, meta-analyses like that of Olderbak et al. (2018) found, contrary to their expectations, that various branches of AEI were not differentially related to Gf or Gc and that some branches were only weakly related to IQ.

Meanwhile, in earlier studies over the past twenty years on the relationship between TEI and IQ, Newsome et al. (2000) found none of their participants' EQ-i (Bar-On, 2004) factor scores, nor the total EQ-i score to be significantly related to the participants' academic achievement. Derksen et al. (2002) found almost no relationship between their Bar-On (2004) EQ-i measure and scores on the General Mental Ability test. In a Dutch sample, Van der Zee et al. (2002) summarized early findings that pointed to a stronger relationship between EQ and personality than between EQ and general intelligence.

Arteche et al. (2008) found very little relationship between the Bar-On EQ-i measure and the Watson-Glaser Critical Thinking test. Di Fabio and Saklofske (2014) used three EI tests and the Ravens Progressive Matrices with Italian students and found the MSCEIT level of the participants' AEI related to being related to their mental intelligence (r = .31, N = 194). More recently, in a brain mapping study, Barbey et al. (2014) found a significant relationship between EQ and various measures of intelligence, but they used an ability, not a trait, measure of EQ.

Many studies have examined whether traditional IQ scores or EQ scores better predicted some educational, life or work outcomes (Cuppello et al., 2023; Frederickson et al., 2012; Furnham & Petrides, 2003; Singh & Sharma, 2012). For instance, Sanchez-Ruiz et al. (2013) studied 500 primary school children and found modest associations, limited to one-year duration, between TEI and academic achievement. Nath et al. (2015) found their measures of EQ and traditional IQ to be negatively correlated to each other, with no significant correlation between EQ and/or IQ and medical school academic performance.

In a recent and important meta-analysis of the relationship between intelligence personality, both ability and trait EQ, and academic performance MacCann et al. (2020) showed an overall effect of ρ = .20, with the association significantly stronger for AEI compared with TEI or mixed EQ. However, the three EQ measures accounted for less than 5% of the variance in this regression analysis. They proposed three mechanisms to explain the EQ/academic performance link: 1) EQ helps regulate academic emotions, 2) EQ helps to build social relationships at school, and 3) academic content overlaps with EQ.

In our study, we aimed to advance an understanding of the relationship between EQ and IQ with three methodological improvements in our research. *First*, we used a large, adult sample, while most prior studies have been confined to small student groups. *Second*, we used well-validated multidimensional instruments of both EQ and IQ. *Third*, we used structural equation modelling to explore the relationships between these two variables. Based on prior literature regarding the relationship between (all) personality traits and different measures

of the traditional intelligence concept (fluid and crystalised), we predicted many low correlations between EQ and IQ.

A few prior studies examined the relationship between our chosen measure of EQ, namely the TEiQ, and different measures of intelligence. Frederickson et al. (2012) found a small but significant positive correlation of r = .18 in a large group (N = 1140) of 11 - 13-year-old British students, while Furnham and Petrides (2003) found no significant relationship between EQ and IQ among 81 British adults, and Sanchez-Ruiz et al. (2013) found no relationship between EQ and IQ among 323 Cypriot university students.

While prior results have been mixed, a few studies relating personality to intelligence may provide explanatory clues. Moutafi et al. (2003, 2004) argued that relatively less intelligent individuals might utilize personality traits to become more methodical, organized, thorough, and persistent (i.e. conscientious), permitting them to *compensate* for their relative IQ weakness. Also, relatively more intelligent people may enhance performance with cognitive efficiency despite the relative lack of effort (Moutafi et al., 2003). The idea that personality conscientiousness may act as a coping strategy for relatively less intelligent people has been referred to as the Intelligence Compensation Theory (ICT), and it has attracted substantial research attention (Wood & Englert, 2009). Similarly, various researchers who examined the educational correlates of EQ and IQ have found little correlation between these measures (e.g. MacCann et al., 2020), while others have found that EQ acts as a mediator variable between IQ and educational outcomes (Mavroveli & Sanchez-Ruiz, 2011; Petrides et al., 2004). Thus, the suggestion is that those with higher EQ use their personality and social skills to compensate or persuade others to help them, and through these attributes, they achieve higher grades. Over time, they may invest more time and energy in developing their EQ scores, suggesting that EQ can, to an extent, be trained. We expected the current study to add to this literature through its large adult participant population and a valid multi-faceted measure of intelligence. We expected these methodological improvements to allow us to perform factor analyses on the EQ and IQ measures and explore the relationship between these two concepts through structural equation modelling. We hypothesized that we would find low and predominantly negative correlations at both the domain and facet levels of these measurement tools.

2. Method

2.1. Participants

In all, there were 6439 (2396 female, 4043 male) participants (Mage = 42.2 years, SD = 10.7 years). The vast majority of these participants were employed (4820 full-time; 319 part-time, and 380 self-employed), while a few were students (105, 1.6%), unemployed (728, 11.1%), or did not state their employment. In total, 37% (2437) of participants had a first degree, 19.6% (1291) had A-level/12th-grade equivalent, and 12.6% (827) had GCSE/O level/10th-grade educations. Most were

White-British (5290, 80.4%), White-Non-British (406, 6.3%), Asian/Asian-British (299, 4.5%), and Black/Black-British (127, 1.9%). In total, 29.6% (1946) were non-managers, 14% (921) were first-line managers, 20.5% (1348) were middle managers, and 23.3% (1535) were executive or senior managers. Compared to the average British population, they were better educated.

2.2. Measures

Trait Emotional Intelligence Questionnaire (*TEiQ*): We used the TEiQ to measure the participants' self-reported EQ. The TEiQ is divided into four broad categories or factors (Well-being, Self-control, Emotionality and Sociability), formed of 15 different facets and two additional independent ones that provided a more detailed description and understanding of the measurements. The Cronbach's alpha is .94 for males and .95 for females, showing the TEIQue to have good internal validity (Mikolajczak et al., 2007). There is abundant evidence of the good psychometric properties (reliability, construct and predictive validity) of this instrument (Andrei, et al., 2016; Petrides, 2009).

General Intelligence Assessment (*GIA*): The GIA assesses an individual's cognitive abilities, by measuring the respondent's speed and accuracy in answering cognitive test items that range across five domains relevant to work contexts: *Verbal Reasoning*, *Perceptual Speed*, *Number Speed*, *Word Meaning*, *and Spatial Visualisation* (Dann, 2015; Furnham & Treglown, 2018). Its primary aim is to measure speed of mental processing (i.e. fluid intelligence and procedural knowledge), rather than depth of knowledge (i.e. crystallised intelligence and declarative facts). It measures an individuals' ability to process novel information efficiently (Dann, 2015). It consists of five tests that are presented in real-time, via computer-based item-generation (Irvine et al., 1990). Each test assesses a particular cognitive function through one type of task. All questions are of equal difficulty, and the response format is multiple-choice, with no time limit imposed (Dann, 2015).

Individual scores for the five subtests are calculated as adjusted scores; overall scores that account for respondent guesses through the following equation:

$$N_{correct} - \left(\frac{N_{incorrect}}{K-1} \right)$$

where N represents the number of correct or incorrect items and K the number of potential alternative answers for the particular question. An overall adjusted score can be calculated as a measure of participants' general fluid intelligence across the five subtests. The test has good internal validity, with average test-retest correlations ranging from .75 to .86 (Furnham & Treglown, 2018). The total score has been found to correlate highly (r = .74) with the Raven's Progressive Matrices test (Dann, 2015).

2.3. Procedure

Participants completed both assessments online at a time and place (home/lab)

that best suited them. The data was collected through an online tech-portal within a psychometrics company web page, login details provided by the company to each participant. We analysed all the data that were stored in the system where participants had done both tests. Participants' consented to their anonymised data being used in research studies.

2.4. Data Analysis

The dataset was organized and cleaned using Statistical Package for the Social Sciences (SPSS, Version 24.0). Structural Equation Modelling (SEM) was conducted in the Lavaan package (Rosseel, 2012; version .5 - 20) of R (version 3.3.0). Based upon Kline's (2005) recommendations, the following fit indices were applied: the χ^2/df ratio, RMSEA, Standardized Root Mean Residual (SRMR), and the Comparative Fit Index (CFI). An excellent fit is indicated when χ^2/df < 3.00 (van Dam, 2015), RMSEA < .05 (MacCallum et al., 1996), SRMR > .08 (Hu & Bentler, 1998), and CFI > .95 (Hooper et al., 2008).

We first "cleaned" the data looking for factors like outliers, skew and incomplete responses. We first explored individual difference correlates of both measures. Then we looked at the correlations between the two at facet level. Third, we did an exploratory factor analysis of all facets combined and finally we did a SEM exploring the relationships between out two major variables.

3. Results

3.1. Differences in Participant Characteristics (Gender, Education, and Manager Level) on Measures of Emotional and Fluid Intelligence

Gender: A series of ANOVAs were run to examine participant characteristic differences in emotional and fluid intelligence. Researchers in this field have emphasized the need for studies to report effect sizes (Sullivan & Feinn, 2012), arguing that large sample sizes bring guarantees of statistical significance without insight into practical significance (Khalilzadeh & Tasci, 2017). As such, this study has placed an emphasis on examining the effect size of these differences to gauge the magnitude of significant differences.

For the participant characteristic, gender, nine of the fifteen EQ traits had only small effect size differences. Males scored slightly higher on Emotion Regulation (*MDiff* = .28), Stress Management (*MDiff* = .25), Emotion Management (*MDiff* = .20), and Assertiveness (*MDiff* = .28) whilst female participants scored higher on Optimism (*MDiff* = .19), Empathy (*MDiff* = .21), Emotion Perception (*MDiff* = .20), Emotion Expression (*MDiff* = .22), and Relationships (*MDiff* = .20). On the other six traits and on the overall TEIQue, there were negligible effect size gender differences.

For fluid intelligence, there were small effect size gender differences on two of the five subtests, with male participants scoring higher than females on Number Speed (*MDiff* = 2.5) and Spatial Visualisation (*MDiff* = 1.4). On the other three

subtests and overall fluid intelligence there were negligible effect size gender differences. Thus, these results demonstrate support for the gender-similarity hypothesis (Hyde, 2007), finding that differences in emotional and fluid intelligence between gender are small at best.

Education: As with gender, we ran a series of ANOVAs to examine differences in fluid and emotional intelligence by education level and measured their effect sizes. For EQ as measured by the TEIQue, none of the effect sizes reached the cut-off for a small effect, indicating negligible differences in emotional intelligence by participants' education. For fluid intelligence, there were small effect sizes for three scores from the GIA (*Number Speed*, *Word Meaning*, and *Overall GIA*). Post-hoc Tukey analyses indicated that participants in higher educational achievement groups (e.g. MBA, MSc, or PHD) scored higher on these sub-tests than those in lower educational achievement groups (e.g. School Leavers, GCSEs, or A-Levels). On other GIA sub-tests, educational differences between participants were negligible in their effect size. Thus, there was little-to-no participant educational difference associated with the participants' fluid or emotional intelligence.

Manager Level: Finally, we ran ANOVAs to examine differences in emotional and fluid intelligence associated with the participants' manager level in their occupational status. Six EQ traits (and overall emotional intelligence) on the TEIQue had small effect sizes. Post-hoc Tukey HSD analyses indicated that being engaged in higher occupational manager levels was associated with scoring higher on *Emotion Regulation*, *Impulse Control*, *Stress Management*, *Emotion Management*, *Social Awareness*, *Adaptability* and *Overall TEIQue*. *Assertiveness* had a medium effect size, with results indicating higher assertiveness was associated with increased manager level.

For fluid intelligence, there was a small effect size difference only on *Word*, with results indicating that participants in higher manager levels scored higher on *Word Meaning*. As there were negliglible effect sizes for other GIA sub-tests and overall fluid intelligence, there was little to no difference in either fluid or emotional intelligence that was associated with manager level. Only higher *Assertiveness* was related to higher manager level.

3.2. Correlations

Table 1 shows the correlations between the total EQ and IQ measures ($r = -.07$) and the correlations between their facets. Three things are striking about these results. First, the majority of the correlations were both negative and significant. There were only eight significant positive correlations, and all of these were involved with just two EQ facet, namely *Emotional Management* and *Assertiveness*. Second, most correlations were relatively small with only 6/75 showing an $r > .10$. Interestingly, four of these were with Number Speed. Third, while some of the IQ facets seemed to be significantly correlated with nearly all the EQ facets (e.g. Number Speed), others (e.g. Spatial Visualisation) were significantly correlated with just over half of the EQ facets.

Table 1. Correlations between GIA overall and subtest scores with overall TEIQue and 15 individual facets.

	GIA	Reasoning	Perceptual Speed	Number Speed	Word Meaning	Spatial Visualisation
Overall TEIQue	−.07***	−.06***	−.05***	−.07***	−.05***	−.02
Happiness	**−.07*** **	−.05***	−.03**	−.06***	−.06***	−.04**
Optimism	**−.02**	.01	−.01	−.04**	−.01	−.01
Self Esteem	**−.04*** **	−.05***	−.04***	−.01	−.05***	.00
Emotion Regulation	**−.07*** **	−.08***	−.06***	−.05***	−.05***	.00
Impulse Control	**−.12*** **	−.13***	−.07***	−.10***	−.09***	−.03**
Stress Management	**−.06*** **	−.08***	−.04***	−.02	−.05***	.00
Empathy	**−.03****	−.01	−.02	−.07***	.00	−.02
Emotion Perception	**−.07*** **	−.04***	−.04**	−.10***	−.04**	−.03**
Emotion Expression	**−.06*** **	−.03*	−.02	−.09***	−.02	−.04**
Relationships	**−.07*** **	−.04***	−.02	−.10***	−.06***	−.05***
Emotion Management	**.09*** **	.05***	.03*	.10***	.11***	.06***
Assertiveness	**.02**	.00	−.02	.04**	.03*	.04**
Social Awareness	**−.07*** **	−.05***	−.05***	−.06***	−.05***	−.04***
Adaptability	**−.09*** **	−.07***	−.06***	−.09***	−.08***	−.02*
Self-Motivation	**−.05*** **	−.05***	−.01	−.07***	−.06***	−.01

***$p < .001$; **$p < .01$; *$p < .05$.

We also explored whether the relationship between our two variables was perhaps non-linear. The results indicated this was not the case.

Table 2 shows the results of an EFA with varimax rotation with six factors. We performed this analysis with both orthogonal and oblique rotations, but the results were very similar. GIA loaded onto one factor whilst the TEIQue was represented by four factors, but with *Adaptability* and *Self-Motivation* loading onto the *Self-Control* factor. The EFA explained an accumulative 56.0% of the variance.

3.3. Structural Equation Modelling

SEM was used to conduct multiple regressions to analyse the role of emotional intelligence in cognitive ability. We are exploring the "causal" link between EQ and IQ. All variables were entered as observed variables, including the five GIA subtest (*Reasoning*, *Perceptual Speed*, *Number Speed & Accuracy*, *Word Meaning*, and *Spatial Visualization*) and the 15 TEIQue facets. Non-significant regressions were removed in a backward-elimination fashion, where the model was re-tested until only significant terms remained. Whilst forms of stepwise procedures in psychological analysis has been criticised for increasing the chance of Type I error (e.g. Henderson & Denison, 1989), researchers have argued that analyses have a lower chance of inflating Type I error when studies have: 1) near

Table 2. Exploratory factor analysis with varimax rotation of TEIQue and GIA.

	Factors					
	1	2	3	4	5	6
Emotion Regulation	**.787**	.149	−.032	.182	.15	−.091
Stress Management	**.725**	.167	−.018	.199	.28	−.118
Impulse Control	**.705**	.271	−.086	.045	.052	.3
Adaptability	**.557**	.3	−.061	.205	.259	−.049
Self-Motivation	**.477**	.285	−.018	.199	.281	.207
Emotion Perception	.194	**.715**	−.051	.238	.155	−.002
Empathy	.272	**.672**	−.003	.14	.108	−.101
Emotion Expression	.132	**.667**	−.05	.232	.247	.105
Relationships	.358	**.560**	−.021	−.005	.324	.111
Reasoning	−.084	.036	**.703**	−.01	.013	−.006
Perceptual Speed	−.025	.008	**.668**	−.056	.024	.057
Number Speed	−.016	−.124	**.639**	.072	−.013	−.042
Word Meaning	−.054	.046	**.636**	.036	−.05	−.034
Spatial Visualisation	.038	−.051	**.496**	.025	−.025	.003
Assertiveness	.269	.069	.045	**.689**	.164	.153
Emotion Management	.055	.245	.101	**.653**	.049	−.141
Social Awareness	.321	.406	−.063	**.585**	.294	.005
Happiness	.297	.313	−.051	.15	**.710**	.068
Optimism	.245	.257	.005	.176	**.672**	−.071
Self Esteem	.344	.217	−.049	.442	**.463**	.089
Eigenvalues	2.893	2.479	2.038	1.789	1.742	.258
% Variance Explained	14.5%	12.4%	10.2%	8.9%	8.7%	1.3%

zero sum of squares explained across steps, 2) small number of predictor variables, and/or 3) large sample size. Additionally, the use of stepwise procedures has been argued to be beneficial in exploratory, predictive research as well as have the implication of suppressing the overall explanatory power of outcome variables due to the exclusion of suppressor variables. Due to this study having a large sample size, it was concluded that the use of stepwise procedures would not inflate Type I error to the point of the model producing results based on capitalizing chance.

The results of the model can be found in Figure 1. The chi-square statistic was significant (χ^2 (35) = 68.4, p = .002), indicating the model significantly differed from the data. However, previous research has criticised the use of chi-square due to its sensitivity to sample size, with academics recommending the use of alternative indices (Bentler & Bonett, 1980). Other fitness indices, however, suggested that the model was an excellent fit of the data: χ^2/df = 1.95; CFI = .996; TLI = .992; RMSEA = .011 [upper 90% CI = .016; lower 90% CI = .007]; SRMR = .006.

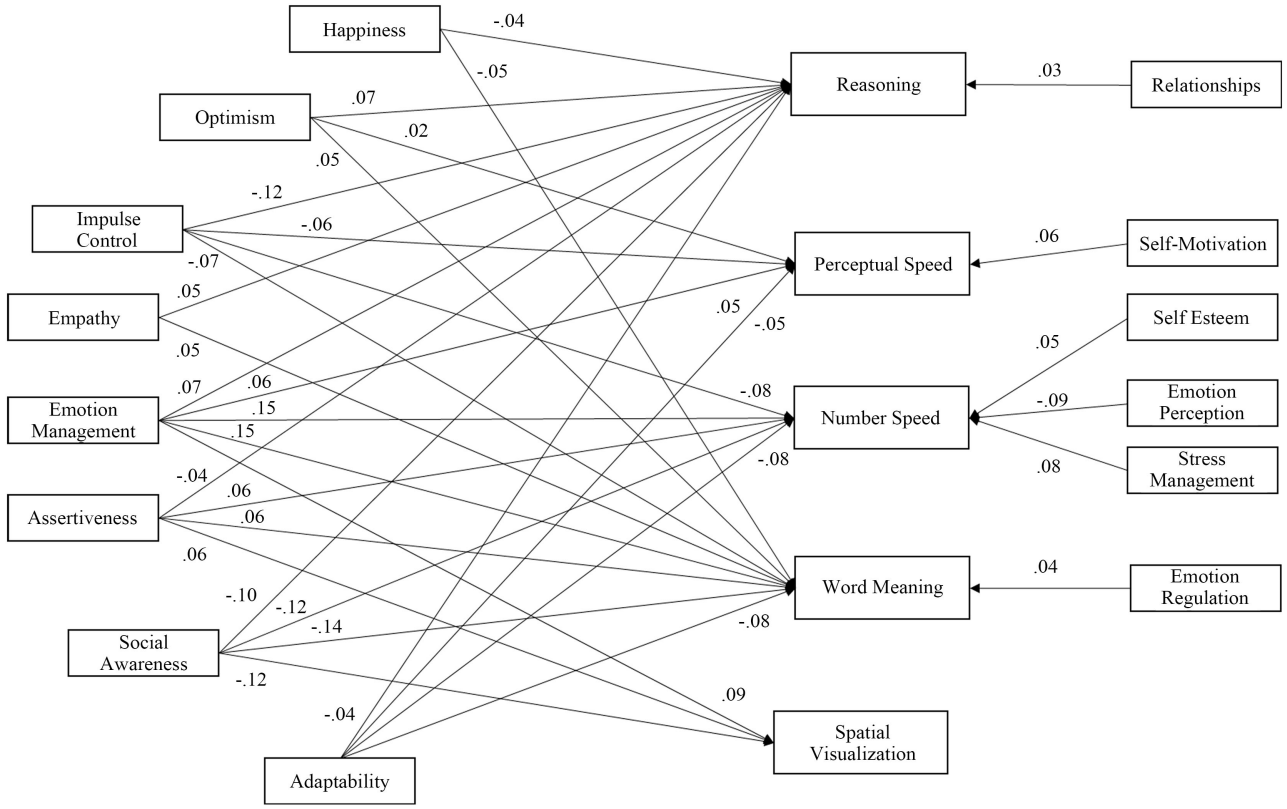

Figure 1. The results of the SEM analysis.

The results of the SEM indicated that individuals with higher *Reasoning* had significantly higher levels of Optimism, Empathy, Relationships, and Assertiveness, but lower levels of Happiness, Impulse Control, Social Awareness, and Adaptability. Higher levels of *Perceptual Speed* were seen in participants with significantly higher Optimism, Emotion Management, and Self-Motivation, but lower levels of Impulse Control, Social Awareness and Adaptability. Higher *Number Speed* scores were predicted by participants with higher Self-Esteem, Stress Management, Emotion Management, and Assertiveness, but lower levels of Impulse Control, Emotion Perception, Social Awareness, and Adaptability. *Word Meaning* was significantly predicted by higher Optimism, Emotion Regulation, Empathy, Emotion Management, and Assertiveness, but lower levels of Happiness, Impulse Control, Social Awareness and Adaptability. Finally, higher levels of *Spatial Visualisation* were predicted by higher levels of Emotion Management and Assertiveness, but lower levels of Social Awareness.

4. Discussion

These results indicate the extent to which trait EQ and IQ are related. Overall, the size of the correlations was higher than found in most studies in the personality-ability area. However, the size of the correlations were, on the whole, so small that it is reasonable to conclude that *the two concepts (as measured by these tests) are essentially unrelated*. The data in this area is equivocal, but where

correlations have been shown to be significant they have tended to be positive (Frederickson et al., 2012). In this study, however, they were predominantly negative, albeit very small.

There were however three interesting findings in this study. *First*, that overall EQ and IQ are negatively related (particularly impulse control); *second*, that some facets of IQ (number speed) were more closely related to EQ facets than others; and *third*, item level analysis and SEM revealed that there are consistent positive and negative relationships between EQ and IQ. For instance, Impulse Control, Social Awareness, and Adaptability appeared to negatively predict most IQ factors. However, Optimism, Emotion Management, and Assertiveness appeared to be consistent positive predictors of IQ, indicating that the EQ-IQ relationship is more nuanced than has been previously proposed.

Both the correlational and SEM results indicated that Emotion Management was the strongest positive correlate of nearly all the IQ factors. According to the manual, Emotion Management measures "*your ability to manage other people's emotional states. It looks at how effective you believe you are in influencing how other people feel. This could range from making someone smile to motivating a group of people towards a common goal*". There are two issues here: first, self-confidence in social interaction, and second, the ability to influence others, both of which are clearly important factors in success in life. It could be argued that brighter people understand and learn the importance of emotional management earlier and better than less intelligent people.

The explanation for IQ and EQ negatively relating to impulse control may relate to trait Neuroticism known to be consistently and significantly negatively correlated with IQ, because of test taking style: the anxiety in Neurotics inhibits their response style. That is, if they were less anxious they would score higher on most tests. Similarly, emotional management and optimism would be an advantage in a test taking situation. That is, facets of trait Neuroticism have been linked to IQ test scores predominantly because of test-taking style. The idea of test-taking strategies may provide also some explanation for these results. Whilst it is not possible to fake intelligence scores (except downwards) it is possible to fake EQ. Thus, in a test-taking situation, such as used here, it may have been that candidates were tempted by using impression management techniques to increase their EQ score, and that those with lower IQ scores felt this pressure more than those who felt they would get higher scores.

Early writers in the area of EQ noted how EQ developed particularly in adolescents and that some people (often very clever) males avoided opportunities to learn these skills. Many observers have commented on the "geeky", "nerdy", and individuals who appeared to have very high IQs but very low EQs (Furnham, 2009). Perhaps this is also partly due to them struggling to relate to others and having a harder time finding friend groups where they could practise socialising. Especially recently, they may be drawn to more remote online communities (e.g. sites like 4chan) where they learn maladjusted ideology, which further inhibits so-

cialisation. Some argued that the two should be positively related as the former helped acquire the latter: namely that brighter people learned better and faster at everything, including emotional intelligence. Equally, it could be argued that less intelligent people learn and use emotional intelligence scores to compensate for their abilities and get other people to help them. This is essentially the same "compensation" argument made for the consistent negative relationship between trait conscientiousness and intelligence (Moutafi et al., 2004).

One relevant question is how "fixed" and "stable" are EQ and IQ? Most longitudinal studies suggest that IQ is very stable over time. Deary et al. (2013) showed that the correlation between intelligence scores at age 11 and age 77 was .63, which adjusted to .73 when corrected for attenuation of the ability range within the re-tested sample. This, they argued, shows that mental ability differences show substantial stability from childhood to late life. The same is not true for EQ, however, which years ago was conceived as a social skill, and which could be learned. Hence, it is not unusual to see educational programmes on improving EQ but very few IQ.

Because people observe in educational and work settings that EQ skills are highly desirable, many make an effort to improve those skills, particularly those who rightly or wrongly rate their IQ as low (Furnham & Dissou, 2007; Furnham & Robinson, 2023). Hence, one may expect that the correlation between EQ and IQ grows larger and more significant over time, the former as seen to "compensate" for the latter. This might also partly explain the inconsistent results in this study. There is evidence that people value both IQ and EQ in others but particularly the latter (Furnham et al., 2012).

This study was not without its limitations. Although there was a large sample, it was not representative of the population in terms of age and education, particularly the latter, which is often related to both variables measured here. There were almost twice as many males as females, and the populations were essentially middle-aged and middle-class. Further, it would have been very desirable to measure the Big Five, clearly related to EQ, as well as an Ability measure of EQ, and a measure of crystallized intelligence. Also, we did not measure other potentially important mediating variables like education history, job type or social desirability. Nevertheless, we have a clear and novel finding that requires further research.

5. Conclusion

Just as the many studies on the relationship between personality traits and intelligence/ability test scores show very few significant results, so this study has demonstrated that trait EI is essentially unrelated to IQ. However, an analysis at the facet level of both variables, did demonstrate small significant and mainly negative relationships. Hence, it is unwise to infer traits from ability scores and vice versa. Furthermore, it is essential that both variables (traits and abilities) are measured separately in applied settings to get a more rounded picture of the individual.

Data Availability

This is obtainable from the first author on request

Registration

This paper was not pre-registered with the journal

Authors' Contribution

L.T. collected the data and did the statistical analyses, and A.F. wrote the paper.

Ethics

This was sought and obtained (CEHP/514/2017)

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

Ackerman, P. L. (2018). The Search for Personality-Intelligence Relations: Methodological and Conceptual Issues. *Journal of Intelligence, 6,* 2-13. https://doi.org/10.3390/jintelligence6010002

Andrei, F., Siegling, A. B., Aloe, A. M., Baldaro, B., & Petrides, K. V. (2016). The Incremental Validity of the Trait Emotional Intelligence Questionnaire (TEIQue): A Systematic Review and Meta-Analysis. *Journal of Personality Assessment, 98,* 261-276. https://doi.org/10.1080/00223891.2015.1084630

Arteche, A., Chamorro-Premuzic, T., Furnham, A., & Crump, J. (2008). The Relationship of Trait EI with Personality, IQ and Sex in a UK Sample of Employees. *International Journal of Selection and Assessment, 16,* 421-426. https://doi.org/10.1111/j.1468-2389.2008.00446.x

Barbey, A., Colom, R., & Grafman, J. (2014). Distributed Neural System for Emotional Intelligence Revealed by Lesion Mapping. *Social Cognitive and Affective Neuroscience, 9,* 265-272. https://doi.org/10.1093/scan/nss124

Bar-On, R. (2004). The Bar-On Emotional Quotient Inventory (EQ-i): Rationale, Description and Psychometric Properties. In G. Geher (Ed.), *Measuring Emotional Intelligence: Common Ground and Controversy* (pp. 115-145). Nova Science.

Bédard, M. A., & Le Corff, Y. (2020). Intelligence and Personality: A Replication and Extension Study of the Association between Intelligence and Personality Aspects. *Journal of Individual Differences, 41,* 124-132. https://doi.org/10.1027/1614-0001/a000311

Bentler, P. M., & Bonett, D. G. (1980). Significance Tests and Goodness of Fit in the Analysis of Covariance Structures. *Psychological Bulletin, 88,* 588-606. https://doi.org/10.1037/0033-2909.88.3.588

Chamorro-Premuzic, T., Furnham, A., & Moutafi, J. (2004). The Relationship between Estimated and Psychometric Personality and Intelligence Scores. *Journal of Research in*

Personality, 38, 505-513. https://doi.org/10.1016/j.jrp.2003.10.002

Cuppello, S., Treglown, L., & Furnham, A. (2023). Personality and Management Level: Traits That Get You to the Top. *Personality and Individual Difference, 206,* Article ID: 112108. https://doi.org/10.1016/j.paid.2023.112108

Dann, P. (2015). *The General Intelligence Assessment (GIA) Technical Manual*. Thomas International Limited.

Deary, I. J., Pattie, A., & Starr, J. M. (2013). The Stability of Intelligence from Age 11 to Age 90 Years: The Lothian Birth Cohort of 1921. *Psychological Science, 24,* 2361-2368. https://doi.org/10.1177/0956797613486487

Derksen, J, Kramer, I., & Katzko, M. (2002). Does a Self-Report Measure for Emotional Intelligence Assess Something Different than General Intelligence? *Personality and Individual Differences, 32,* 37-48. https://doi.org/10.1016/S0191-8869(01)00004-6

Di Fabio, A., & Saklofske, D. (2014). Comparing Ability and Self-Report Trait Emotional Intelligence, Fluid Intelligence, and Personality Traits in Career Decision. *Personality and Individual Differences, 64,* 174-178. https://doi.org/10.1016/j.paid.2014.02.024

Frederickson, N., Petrides, K. V., & Simmonds, E. (2012). Trait Emotional Intelligence as a Predictor of Socioemotional Outcomes in Early Adolescence. *Personality and Individual Differences, 52,* 323-328. https://doi.org/10.1016/j.paid.2011.10.034

Furnham, A. (2009). The Importance and Training of Emotional Intelligence at Work. In J. Parker, D. Saklofske, & C. Stough (Eds.), *Assessing Emotional Intelligence* (pp. 137-155). Springer. https://doi.org/10.1007/978-0-387-88370-0_8

Furnham, A., & Dissou, G. (2007). The Relationship between Self-Estimated and Test Derived Scores of Personality and Intelligence. *Journal of Individual Differences, 28,* 37-44. https://doi.org/10.1027/1614-0001.28.1.37

Furnham, A., & Petrides, K. V. (2003). Trait Emotional Intelligence and Happiness. *Social Behavior and Personality, 31,* 815-824. https://doi.org/10.2224/sbp.2003.31.8.815

Furnham, A., & Robinson, C. (2023). Sex Difference in Estimated Intelligence and Estimated Emotional Intelligence and IQ Scores. *Journal of Genetic Psychology, 184,* 133-144. https://doi.org/10.1080/00221325.2022.2140025

Furnham, A., & Treglown, L. (2018). High Potential Personality and Intelligence. *Personality and Individual Differences, 128,* 81-87. https://doi.org/10.1016/j.paid.2018.02.025

Furnham, A., McClelland, A., & Mansi, A. (2012). Selecting Your Boss: Sex, Age, IQ and EQ Factors. *Personality and Individual Differences, 53,* 552-556. https://doi.org/10.1016/j.paid.2012.04.005

Henderson, D. A., & Denison, D. R. (1989). Stepwise Regression in Social and Psychological Research. *Psychological Reports, 64,* 251-257. https://doi.org/10.2466/pr0.1989.64.1.251

Hooper, D., Coughlan, J., & Mullen, M. (2008). Structural Equation Modelling: Guidelines for Determining Model Fit. *Electronic Journal of Business Research Methods, 6,* 53-60. https://mural.maynoothuniversity.ie

Hu, L. T., & Bentler, P. M. (1998). Fit Indices in Covariance Structure Modelling: Sensitivity to Under-Parameterized Model Misspecification. *Psychological Methods, 3,* 424-453. https://doi.org/10.1037/1082-989X.3.4.424

Hyde, J. S. (2007). New Directions in the Study of Gender Similarities and Differences. *Current Directions in Psychological Science, 16,* 259-263. https://doi.org/10.1111/j.1467-8721.2007.00516.x

Irvine, S. H., Dann, P. L., & Anderson, J. D. (1990). Towards a Theory of Algorithm- De-

termined Cognitive Test Construction. *British Journal of Psychology, 81,* 173-195. https://doi.org/10.1111/j.2044-8295.1990.tb02354.x

Khalilzadeh, J., & Tasci, A. D. (2017). Large Sample Size, Significance Level, and the Effect Size: Solutions to Perils of Using Big Data for Academic Research. *Tourism Management, 62,* 89-96. https://doi.org/10.1016/j.tourman.2017.03.026

Kline, T. (2005). *Psychological Testing: A Practical Approach to Design and Evaluation*. Sage. https://doi.org/10.4135/9781483385693

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power Analysis and Determination of Sample Size for Covariance Structure Modelling. *Psychological Methods, 1,* 130-149. https://doi.org/10.1037/1082-989X.1.2.130

MacCann, C., Jiang, Y., Brown, L. E. R., Double, K. S., Bucich, M., & Minbashian, A. (2020). Emotional Intelligence Predicts Academic Performance: A Meta-Analysis. *Psychological Bulletin, 146,* 150-186. https://doi.org/10.1037/bul0000219

Matthews, G., Zeidner, M., & Roberts, R. D. (2002). *Emotional Intelligence: Science and Myth*. MIT Press. https://doi.org/10.7551/mitpress/2704.001.0001

Mavroveli, S., & Sanchez-Ruiz, M. J. (2011). Trait Emotional Intelligence Influences on Academic Achievement and School Behaviour. *British Journal of Educational Psychology, 81,* 112-134. https://doi.org/10.1348/2044-8279.002009

Mikolajczak, M., Luminet, O., Leroy, C., & Roy, E. (2007). Psychometric Properties of the Trait Emotional Intelligence Questionnaire: Factor Structure, Reliability, Construct, and Incremental Validity in a French-Speaking Population *European Journal of Personality Assessment, 88,* 338-353. https://doi.org/10.1080/00223890701333431

Moutafi, J., Furnham, A., & Crump, J. (2003). Demographic and Personality Predictors of Intelligence: A Study Using the Neo Personality Inventory and the Myers-Briggs Type Indicator. *European Journal of Personality, 17,* 79-94. https://doi.org/10.1002/per.471

Moutafi, J., Furnham, A., & Paltiel, L. (2004). Why Is Conscientiousness Negatively Correlated with Intelligence? *Personality and Individual Differences, 37,* 1013-1022. https://doi.org/10.1016/j.paid.2003.11.010

Nath, S., Ghosh, S., & Das, S. (2015). Relation between Intelligence, Emotional Intelligence, and Academic Performance among Medical Interns. *Open Journal in Psychiatry and Allied Sciences, 6,* 96-100. https://doi.org/10.5958/2394-2061.2015.00004.X

Newsome, S., Day, A., & Catano, V. (2000). Assessing the Predictive Validity of Emotional Intelligence. *Personality and Individual Differences, 29,* 1005-1016. https://doi.org/10.1016/S0191-8869(99)00250-0

Olderbak, S., Semmler, M., & Doebler, P. (2018). Four-Branch Model of Ability Emotional Intelligence with Fluid and Crystallized Intelligence: A Meta-Analysis of Relations. *Emotion Review, 11,* 166-183. https://doi.org/10.1177/1754073918776776

Petrides, K. V. (2009). *Technical Manual for the Trait Emotional Intelligence Questionnaire (TEIQue)*. London Psychometric Laboratory. https://doi.org/10.1007/978-0-387-88370-0_5

Petrides, K. V. (2011). Ability and Trait Emotional Intelligence. In T. Chamorro-Premuzic, S. Von Stumm, & A. Furnham (Eds.), *The Wiley Blackwell Handbook of Individual Differences* (pp. 656-678). Wiley-Blackwell. https://doi.org/10.1002/9781444343120.ch25

Petrides, K. V., & Furnham, A. (2001). Trait Emotional Intelligence: Psychometric Investigation with Reference to Established Trait Taxonomies. *European Journal of Personality, 15,* 425-448. https://doi.org/10.1002/per.416

Petrides, K. V., & Furnham, A. (2003). Trait Emotional Intelligence: Behavioural Validation in Two Studies of Emotion Recognition and Reactivity to Mood Induction. *Euro-*

pean Journal of Personality, 17, 39-57. https://doi.org/10.1002/per.466

Petrides, K. V., Frederickson, N., & Furnham, A. (2004). The Role of Trait Emotional Intelligence in Academic Performance and Deviant Behavior at School. *Personality and Individual Differences, 36,* 277-293. https://doi.org/10.1016/S0191-8869(03)00084-9

Petrides, K. V., Mikolajczak, M., Mavrovelli, S., Sánches-Ruiz, M.-J., Furnham, A., & Pérez-González, J.-C. (2016). Recent Developments in Trait Emotional Intelligence Research. *Emotional Review, 8,* 335-341. https://doi.org/10.1177/1754073916650493

Petrides, K. V., Pérez-González, J.-C., & Furnham, A. (2007). On the Criterion and Incremental Validity of Trait Emotional Intelligence. *Cognition and Emotion, 21,* 26-55. https://doi.org/10.1080/02699930601038912

Rammstedt, B., Lechner, C. M., & Danner, D. (2018). Relationships between Personality and Cognitive Ability: A Facet-Level Analysis. *Journal of Intelligence, 6,* 28-40. https://doi.org/10.3390/jintelligence6020028

Rosseel, Y. (2012). Lavaan: An R Package for Structural Equation Modeling and More. Version 0.5-12 (BETA). *Journal of Statistical Software, 48,* 1-36. https://urgent.be https://doi.org/10.18637/jss.v048.i02

Sanchez-Ruiz, M. J., Mavroveli, S., & Poullis, J. (2013). Trait Emotional Intelligence and Its Links to University Performance: An Examination. *Personality and Individual Differences, 54,* 658-662. https://doi.org/10.1016/j.paid.2012.11.013

Singh, Y., & Sharma, R. (2012). Relationship between General Intelligence, Emotional Intelligence, Stress Levels and Stress Reactivity. *Annals of Neuroscience, 19,* 107-11. https://doi.org/10.5214/ans.0972.7531.190304

Stankov, L. (2018). Low Correlations between Intelligence and Big Five Personality Traits: Need to Broaden the Domain of Personality. *Journal of Intelligence, 6,* 26-37. https://doi.org/10.3390/jintelligence6020026

Sullivan, G. M., & Feinn, R. (2012). Using Effect Size—Or Why the P Value Is Not Enough. *Journal of Graduate Medical Education, 4,* 279-282. https://doi.org/10.4300/JGME-D-12-00156.1

Treglown, L., & Furnham, A. (2022). Age, Sex, Education, EQ, IQ and Management Level: A Study from Great Britain. *Journal of General Management, 48,* 320-329. https://doi.org/10.1177/03063070221107128

Treglown, L., Daria, T., & Furnham, A. (2021). Trait Emotional Intelligence and Job Performance Evaluations: Evidence from Self, Manager, Team and Peer Ratings. *International Journal of Organisational Analysis, 29,* 1156-1171. https://doi.org/10.1108/IJOA-07-2020-2316

Van der Zee, K., Thijs, M., & Schakel, L. (2002). The Relationship of Emotional Intelligence with Academic Intelligence and the Big Five. *European Journal of Personality, 16,* 103-125. https://doi.org/10.1002/per.434

Völker, J. (2020). An Examination of Ability Emotional Intelligence and Its Relationships with Fluid and Crystallized Abilities in a Student Sample. *Journal of Intelligence, 8,* Article 18. https://doi.org/10.3390/jintelligence8020018

Wood, P., & Englert, P. (2009). Intelligence Compensation Theory: A Critical Examination of the Negative Relationship between Conscientiousness and Fluid and Crystallised Intelligence. *Australian and New Zealand Journal of Organisational Psychology, 2,* 19-29. https://doi.org/10.1375/ajop.2.1.19