Associations of trait and ability emotional intelligence with performance on Theory of Mind tasks in an adult sample

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ABSTRACT

In this study the associations of trait and ability measures of emotional intelligence (EI) with social-cognitive and social-perceptual Theory of Mind (ToM) were examined. Verbal ability and the personality traits of Agreeableness and Openness were also assessed. Both trait and ability EI were found to be significantly correlated with performance on social-cognitive but not social-perceptual ToM. Regression modelling showed that one of the ability EI tests, a measure of understanding emotions, and trait EI were significant predictors of social-cognitive ToM performance. The associations of ability EI with social-cognitive but not social-perceptual ToM can be interpreted as reflecting current ability EI tests being constructed in a manner which emphasises the assessment of emotional knowledge rather than on-line processing of emotional information. The results of the present study provide useful initial information on how the conceptually-linked but distinct constructs of EI and ToM are associated in adults; these findings can be used to inform future work in this area.

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1. Introduction

Theory of Mind (ToM) and emotional intelligence (EI) are conceptually-linked but distinct constructs (Blair, 2002), which share an association with effectiveness in social relationships. ToM is the ability to attribute mental states (e.g. beliefs, desires, emotions, intentions) to others and to use this information in the prediction and interpretation of behaviour (e.g. Premack & Woodruff, 1978; Saxe, Carey, & Kanwisher, 2004), and is a key component of successful social interactions (Paal & Bereczkei, 2007). The theoretical overlap between ToM and EI arises because the mental states of others clearly include emotional states, so EI measures would be expected to be correlated with measures of ToM. More specifically, ToM includes the attribution of emotional states to others, a process which EI can facilitate by providing relevant emotion-related capabilities, for example being able to perceive and accurately identify the emotions of others.

Whilst research on ToM arose from the study of individuals on the autistic spectrum, who have characteristically low scores on these tests (e.g. Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001; Kaland, Callesen, Moller-Nielsen, Mortensen, & Smith, 2008), research on EI has mainly focussed on individual differences in the general, non-clinical population. EI research has developed in two parallel strands, with measures of both ability and trait EI

being developed and studied. The ability EI perspective regards EI as a cognitive ability related to reasoning and problem-solving in the emotion domain (Mayer, Roberts, & Barsade, 2008). By contrast, trait EI has been defined as "a constellation of emotional self-perceptions located at the lower levels of personality hierarchies" (Petrides, Pita, & Kokkinaki, 2007). EI is theoretically and empirically linked to social competence. The EI components of understanding and managing emotions are central to effective social relationships, and both trait and ability EI have been found to be associated with social capabilities (e.g. Brackett, Rivers, Shiffman, Lerner, & Salovey, 2006; Mavroveli, Petrides, Rieffe, & Bakker, 2007).

Although EI and ToM are clearly related, and both are associated with social competence, both theoretical considerations and empirical findings also indicate areas of divergence. Examination of studies of two clinical conditions, autism spectrum disorders (ASD) and psychopathy, is informative in this context. ASDs are characterised by marked ToM deficits but less pronounced problems related to EI, whilst psychopathic individuals show EI deficits but less ToM impairment (Blair, 2002; Dolan & Fullam, 2004; Richell et al., 2003). These results suggest a degree of overlap between EI and ToM rather than either an equivalence or a complete dissociation. In addition, theoretical models of EI characterise it as a broad construct with components which would not all be expected to be related equally strongly or, in some cases at all, to ToM. Examples where the conceptual relation between ToM and components of EI is strong include emotion perception, emotional understanding and managing the emotions of others, whilst weak or

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non-existent relationships with ToM would be expected with EI components such as self-esteem, motivation, and regulation of emotion in the self. Conversely, ToM covers some capabilities conceptually unrelated to EI, since it relates to inferring all types of mental states in others, not just emotional states.

Notwithstanding the theoretical links between EI and ToM, their associations have not been widely studied, and to date results have been reported only for children. In a study of primary school children Barlow, Qualter, and Styliano (2010) reported significant correlations of both trait and ability EI with ToM measures, with a correlation pattern that differed for boys and girls. In a second study of children divided into 5–7 and 8–10 year age groups (Qualter, Barlow, & Styliano, in press), only ability EI was found to be related to a false belief test taken by both groups, whilst both trait and ability EI were correlated with the more advanced ToM Faux Pas test (Stone, Baron-Cohen, & Knight, 1998) taken only by the older group, with regression modelling showing that both significantly predicted performance on this social-cognitive ToM test. More detailed analysis showed that it was the emotional understanding ability EI subcomponent which significantly predicted Faux Pas performance.

The theory and results presented above lead to the expectation that EI and ToM should also be associated in adults. In order to develop a more detailed theory of the expected associations, it is useful to consider a division of the broad range of ToM capabilities into two components suggested by Tager-Flusberg and Sullivan (2000): social-cognitive and social-perceptual ToM. Social-cognitive ToM is the ability to reason about the mental states of others, whilst social-perceptual ToM covers rapid judgements of these states using non-verbal cues such as facial expressions and body language. Considering the characteristics of these two ToM components allows the expectations for their associations with ability EI to be worked out in more detail. Social-cognitive ToM is related to social and emotional knowledge, whilst social-perceptual ToM is related to rapid processing of possibly novel information, a distinction which is conceptually similar to that between crystallised and fluid ability (e.g. Boyle, Stankov, & Cattell, 1995). Ability EI tests have been found to be more consistently correlated with crystallised than with fluid ability, particularly with verbal ability tests, and have item content which relates to the assessment of emotional knowledge (e.g. Austin, in press; Farrelly & Austin, 2007; MacCann, Roberts, Matthews, & Zeidner, 2004). This linkage of ability EI as assessed by current tests to the possession of emotion-related knowledge suggests that ability EI test scores should be more strongly associated with social-cognitive than with social-perceptual ToM.

For trait EI, its positive association with empathy (Austin, Evans, Goldwater, & Potter, 2005), which is empirically and theoretically linked to ToM performance (Lawrence, Shaw, Baker, Baron-Cohen, & David, 2004; Voracek & Dressler, 2006), suggests that trait EI should be positively associated with ToM performance in adults as well as in children, but the current literature on trait EI does not allow a specific prediction on the patterning of its associations with social-cognitive and social-perceptual ToM.

The present study examined the associations of trait and ability EI with social-cognitive and social-perceptual ToM in an adult sample. As discussed above, research on ability EI has found evidence of its associations with intelligence, with the most consistent associations being found for verbal ability. Two personality traits, Agreeableness (A) and Openness (O) have also been consistently found to be correlated with ability EI (e.g. Brackett & Mayer, 2003; MacCann & Roberts, 2008). In addition, A has been found to be associated with ToM (Nettle & Liddle, 2008). In order to fully test the hypothesis put forward above of a differential pattern of associations of ability EI with social-cognitive and social-perceptual ToM, A, O and verbal ability were measured, allowing any

overlap between ability EI and ToM accounted for by personality or verbal understanding to be controlled for in the analyses.

2. Methods

2.1. Participants

There were 162 participants (115 female), mean age 34.08 years (SD 15.27 years). Participants came from the postgraduate and undergraduate student population (38%) and the general public; all were native English speakers.

2.2. Materials

2.2.1. Ability EI

The ability EI tests used in this study were the Situational Test of Emotional Understanding (STEU) and Situational Test of Emotion Management (STEM). These tests were developed by MacCann and Roberts (2008). The STEU comprises 42 items, each of these presents a short verbal description of a situation and the respondent is asked to select the emotion that the situation is most likely to give rise to from five alternatives; scoring for this test is theory-based. The STEM is a 44 item multiple choice test, in which participants are presented with a verbal description of a situation requiring the management of emotions in the self and/or others and asked to select the most effective way of managing the situation from a list of four alternatives. Scoring for the STEM is based on expert ratings. Examination of the validity of these tests has established that STEU and STEM scores are correlated with scores on other ability EI tests and with intelligence tests. Two studies with the STEU (Austin, in press; MacCann & Roberts, 2008) have reported significant correlations with intelligence tests ($r = .49$, .32); for the STEM MacCann and Roberts (2008) also found a significant correlation (.41) but this was not replicated in the study by Austin (in press). The STEU was found to be significantly correlated ($r = .40$) with the Stories sub-scale of the Multifactor Emotional Intelligence Scale (MEIS; Mayer, Caruso, & Salovey, 1999) in the MacCann and Roberts (2008) study, and Austin (in press) reported correlations of .36, .33 for the STEM and STEU, respectively with MSCEIT total score.

2.2.2. Social-perceptual ToM

The revised version of the adult Reading the Mind in the Eyes test (Baron-Cohen et al., 2001) was used to measure social-perceptual ToM. The 36 items of this test are photographic images of different individuals' eyes. Participants make a forced-choice decision from four possible answers as to which word accurately describes the state of mind of the individual in the picture. Scores are calculated out of a maximum of 36.

2.2.3. Social-cognitive ToM

The adult version of the Faux Pas test (Stone et al., 1998) measures advanced social-cognitive ToM. The test has 20 items, in which participants are presented with short vignettes each describing a social situation. Participants decide if a character has said something or behaved in a way that is socially inappropriate. If a character has committed a faux pas, participants are asked who did or said something socially awkward, why it was awkward, what the motivation behind saying or doing what they did was and how the other character would feel. If participants answer that no faux pas was committed, they are asked control questions to test for comprehension of the vignette. All participants are asked the control questions. An example of a vignette where the correct response would indicate a faux pas is a customer in a restaurant mistaking another customer for a waiter. An example of a vignette