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Article *in* Intelligence · July 2005

DOI: 10.1016/j.intell.2005.03.001

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INTELLIGENCE

Assessing emotional intelligence in gifted and non-gifted high school students: Outcomes depend on the measure

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Received 24 August 2003; received in revised form 23 February 2005; accepted 2 March 2005
Available online 12 May 2005

Abstract

This study examined academically gifted ($N=83$) and non-gifted ($N=125$) high school students from Israel to compare mean emotional intelligence (EI) scores, various assessment procedures, and relations between EI and ability, across different populations. Participants completed the Mayer–Salovey–Caruso Emotional Intelligence Test (MSCEIT), the Schutte Self-Report Inventory (SSRI), and the Vocabulary subtest of the Hebrew version of the Wechsler Intelligence Scale for Children-Revised (WISC-R-95). Gifted students scored higher on the MSCEIT, but lower on the SSRI. Findings suggest that individual differences are measure dependent, with the profile of scores variable across EI assessment procedures. Concepts assessed by the MSCEIT resemble a type of intelligence, whereas findings with the SSRI are problematic from this perspective. The paper concludes with a discussion of measurement issues, alternative perspectives on tests of EI, and suggestions for future research.

1. Introduction

This study sets out to investigate whether academically gifted high school students obtain higher scores on ability-based and questionnaire-based tests for "emotional intelligence" (EI) than non-gifted

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doi:10.1016/j.intell.2005.03.001

students. In addition to collecting substantive data on the nature of highly intelligent children, the study has both theoretical and methodological aims. The standard, psychometric theory of intelligence (Spearman, 1927) predicts that social–emotional abilities should correlate, at least modestly, with cognitive ability. From a developmental perspective, cognitive (and especially verbal) ability may constrain social–emotional competence. By contrast, systemic approaches, exemplified by Gardner's (1983) theory of multiple intelligences permit EI to be entirely independent from cognitive intelligence and academic aptitude. The methodological issue is the extent to which self-reports of EI may be used in place of objective tests. We aimed to investigate the relationship between the two forms of assessment, and their capacity to discriminate gifted from non-gifted groups.

We embark on our survey of the literature by first discussing the EI construct and methods of assessment. We move on to review contrasting views of the emotional functioning of gifted children, and the role of verbal ability as a possible constraint on EI. We then discuss influences on self-perceptions of EI, and their implications for using questionnaires to assess objective EI. We conclude this survey with a summary of the main hypotheses we wish to test.

1.1. Conceptualization and assessment of emotional intelligence

In general, EI refers to competencies in identifying, understanding, expressing, and managing emotion, in both self and others (e.g., Matthews, Zeidner, & Roberts, 2005; Mayer, Caruso, & Salovey, 2000; Mayer, Salovey, Caruso, & Sitarenios, 2001; Zeidner, Matthews, Roberts, & MacCann, 2003). To relate EI to other forms of intelligence (i.e., from primary mental abilities through to psychometric *g*) requires reliable and valid forms of assessment. Two disparate methods, based largely on the work of independent research teams, are currently employed for the assessment of EI. Mayer, Salovey, and colleagues developed the first method – objective, performance-type measures – over the past decade. Objective tests of EI include the Multi-factor Emotional Intelligence Scale (MEIS; Mayer, Caruso, & Salovey, 1999) and the Mayer–Salovey–Caruso Emotional Intelligence Test (MSCEIT; Mayer, Salovey, & Caruso, 2002; Mayer, Salovey, Caruso, & Sitarenios, 2003). These measures include various subtests that sample four key branches (or facets) of EI: (1) to perceive emotions, (2) to access and generate emotions so as to assist thought, (3) to understand emotions and emotional knowledge, and (4) to reflectively regulate emotions so as to promote emotional and intellectual growth (Mayer & Salovey, 1997). Subtests are comprised either of Likert-type rating scales or multiple-choice items that, for example, require the respondent to rate the level of various emotions exhibited in photographs of faces (emotion perception), or to rate the effectiveness of various ways of dealing with a challenging social encounter (emotion management; see MacCann, Matthews, Zeidner, & Roberts, 2003).

A difficulty for performance-based tests of EI is that of establishing veridical scoring criteria (e.g., Bowman, Markham, & Roberts, 2002). Tests may be scored either with reference to expert judgment of correct answers, or by evaluating responses with respect to a population consensus, which is believed to reflect the optimal answer (Mayer et al., 2000). Both techniques have been criticized as potentially non-veridical (Roberts, Zeidner & Matthews, 2001; Zeidner, Matthews, & Roberts, 2001). Because the present investigation was conducted in Israel, with a Hebrew adapted version, we felt consensus was the more appropriate scoring method (i.e., it seemed indefensible to generalize from expert scores comprising the original, English translation). However, consensus scoring may simply pick up sociocultural beliefs whose accuracy is uncertain. The focus on group differences also opened up an interesting question: Might different consensus scores derived from different populations lead to

different outcomes (see Legree, 1995)? Thus, in this study we explored the performance-based measure – the MSCEIT – using consensus-scores, with weights, however, derived from both the local population (i.e., sample studied) and a standardization group, in order to more fully explore scoring rubrics and correlations with external measures. Despite issues related to scoring, performance-based tests do exhibit acceptable validities as predictors of various criteria related to wellbeing and adjustment (e.g., Lopes, Salovey, & Straus, 2003).

Assessments of EI should show convergent and discriminant evidence for validity with respect to other intelligence and personality constructs. Convergent evidence requires conformity to the standard psychometric model of intelligence (e.g., Spearman, 1927). That is, the principle of positive manifold implies that EI should correlate positively with other mental abilities (even if correlations are typically modest). Discriminant evidence requires (1) that correlations between EI and conventional abilities do not approach unity, and (2) that EI is not strongly correlated with personality traits. In fact, the MEIS correlates moderately (i.e., between .30 and .40) with crystallized intelligence (Mayer et al., 2000; Roberts et al., 2001), but near zero with fluid intelligence (Ciarrochi, Chan, & Caputi, 2000). In the first two studies cited, the correlation was higher for the Understanding branch than for the other branches. It is noted, however, that Carroll's (1993) analyses of multiple data sets show that Gf and Gc are generally highly correlated. This high correlation makes it difficult to reconcile Ciarrochi et al.'s findings with those other studies cited above. In general, then, the MEIS appears to show acceptable convergent and discriminant evidence for validity with respect to established intelligence tests. As Mayer (2001, p. 426) states: "Emotional intelligence is sufficiently related to preexisting intelligences to qualify as an intelligence while being sufficiently distinct to be worth measuring on its own." In addition, discriminant evidence with respect to personality is consistent with current theory; correlations between the MEIS (or MSCEIT) and standard personality traits rarely exceed .30 (Lopes et al., 2003; MacCann et al., 2003; Roberts et al., 2001).

In addition to ability-type measures, various self-report questionnaires, purportedly assessing EI, have been developed (e.g., Bar-On, 1997; Petrides & Furnham, 2001; Schutte et al., 1998). In general, these measures rely on the individual's understanding of their own emotions and management of emotional encounters, and hence measure the self-perception of EI. Moreover, a 360° measure of EI, which reflects differences between self and other perceptions as measures of self-awareness, has also been developed (Boyatzis, Goleman, & Rhee, 2000). The present study focuses on the Schutte Self-Report Inventory (SSRI: Schutte et al., 1998), which is one of the more widely used scales employed within the ratings approach to EI. It is based on the Mayer–Salovey–Caruso conceptual model, providing both an overall score, and scores on sub-scales that resemble three of the four branches of the MEIS and MSCEIT (i.e., Assimilation is not assessed; see MacCann et al., 2003, for a review).

Questionnaire measures of EI show some validity with respect to criterion relations (MacCann et al., 2003; Matthews, Zeidner, & Roberts, 2002; Schutte et al., 1998), but are nevertheless problematic as assessments of ability. Self-report measures of EI consistently correlate close to zero with psychometric measures of intelligence (e.g., Bar-On, 2000; Davies, Stankov & Roberts, 1998; Derksen, Kramer, & Katzko, 2002). Thus, questionnaires fail the convergent validity criterion set by the psychometric model of intelligence (although independence of EI and *g* could be accommodated by Gardner's, 1983 model of multiple intelligences). Another failure of convergent evidence for validity is shown by the lack of a strong correlation between questionnaire measures and the ability-based tests. Brackett and Mayer (2003; see Brackett & Salovey, in press) report correlations of .21 and .18 between the MSCEIT and Bar-On's EQ-i (Bar-On, 1997) and SSRI (Schutte et al., 1998), respectively. Bar-On (2004) presents results from 8 unpublished studies of the MSCEIT and the EQ-i, that show an average un-weighted correlation

of .31 between these measures (total $n = 1256$). A further problem, indicative of poor discriminant validity, is that questionnaire measures share substantial conceptual and demonstrable empirical overlap with existing personality constructs. The SSRI, for example, correlates quite highly with both extraversion and low neuroticism (Saklofske, Austin, & Minski, 2003). Nevertheless, despite these questionable psychometric properties, questionnaires may be valuable for investigating how self-perceptions of emotional intelligence relate to actual competence, an issue that is also relevant to conventional intelligence (Furnham, Chamorro-Premuzic, & Moutafi, submitted for publication).

1.2. Are gifted children more emotionally intelligent than their non-gifted counterparts?

Proponents of EI have had rather little to say about relations between EI and academic giftedness. Mayer, Perkins, Caruso, and Salovey (2001) describe case studies that indicate how emotional giftedness may be distinct from intellectual giftedness, but the article leaves open the issue of how the two forms of giftedness may be related. The present article represents the first, multivariate study of EI in academically gifted students, but there is relevant previous research on the emotional and social adjustment of gifted students, dating back to Terman's (1925) pioneering longitudinal study of "genius". In addition to possessing high levels of academic intelligence, Terman's sample proved to be generally well-adjusted with respect to moral development, emotional maturity, and social relationships. Subsequent studies have generally confirmed this positive view of the social–emotional concomitants of academic ability (e.g., Lubinski & Benbow, 2000). For example, a recent study of over 23,000 eighth graders participating in the National Educational Longitudinal Study showed that students with high self-esteem were 1.5 times more likely to be gifted than students with low self-esteem (Konstantopoulos, Modi, & Hedges, 2001). Comparable associations with giftedness were also found for self-confidence, self-reliance, and achievement motivation. These findings mesh with other results suggesting that intelligence is modestly related to positive attributes such as self-efficacy and ego resiliency, as well as reduced vulnerability to delinquency and some forms of mental illness (Austin et al., 2002; Zeidner, 1995; Zeidner & Matthews, 2000). Perhaps these social–emotional strengths of the gifted child might be attributed to elevated levels of emotional intelligence.

At the same time, other authors have pointed towards potential vulnerabilities of the gifted (Plucker & Levy, 2001). Gifted students may be more prone to adjustment difficulties due to the exclusive characteristics accompanying giftedness. Among these characteristics are low self-esteem, competitiveness, perfectionism, depression, and envy (e.g., Masse & Gagne, 2002; Plucker & Stocking, 2001; Robinson & Noble, 1987). Gifted adolescents are often reported to "feel different" than their peers, resulting in negative consequences for the individual, such as interpersonal conflicts and emotional complications (McLeod & Cropley, 1989). Thus, gifted students are often portrayed by their peers as being somewhat eccentric, isolated from their social environment, snobbish, physically meek, and so forth (e.g., Coleman, 1985; McLeod & Cropley, 1989). These stereotypic perceptions have been made despite little empirical research to substantiate the ensuing claims (see Zeidner & Matthews, 2000). Society may convey exaggerated performance expectations to gifted students. Parents, teachers, and peers tend to attribute extraordinary cognitive abilities to gifted children and expect these students to excel in most areas of academic endeavor (Coleman, 1985; Roedel, 1986). Following on from this proposition, gifted students often believe that teachers and parents take their academic success for granted, applying stringent grading standards in evaluating their work, and failing to provide positive feedback for successful performance (Clinkenbeard, 1991). Furthermore, gifted children who strive, but

fail to meet exceptionally high expectations of success, may suffer from deflated academic self-esteem, evaluative stress and anxiety, depression, and overall poor adjustment to the classroom environment (McMann & Oliver, 1988).

1.3. Verbal ability as a constraint on development of emotional competence

Emotional and cognitive abilities may be linked developmentally, during childhood. In particular, verbal ability (a putative facet of the second-stratum construct, Gc) may constrain the acquisition of emotional and social competence. Thus, Izard et al. (2001) have researched a cluster of abilities described as emotion perception and labeling (EPL), assessed by objective tests. Izard et al. (2001) report correlations between verbal ability and emotion recognition and verbal ability and emotion labeling of .53 and .51, respectively. Indeed, these correlations exceeded that of .48 between the recognition and labeling components of EPL, although Izard et al. also showed that EPL predicted social adjustment criteria with verbal ability controlled. Similarly, Smith and Walden (1999) found that vocabulary correlated at around .30 to .50 with tasks tapping emotional knowledge. In their study, vocabulary mediated effects of deprivation on social–emotional skills, leading to the conclusion that "risk status works, at least in part, through cognitive-language development to influence children's social–emotional development" (p. 106). Such evidence led Zeidner et al. (2003) to propose an investment model of emotional competence (see also Matthews, Roberts, & Zeidner, 2003; Matthews, Zeidner, & Roberts, in press). This model suggests that a child's verbal ability constrains their learning of the rules for socially appropriate feelings and displays of emotion, components that are an important basis for emotional development in early childhood (cf. Denham, 1998).

1.4. Self-estimated vs. psychometric assessments of ability

It appears that self-estimates of ability yield both convergent and discriminant relations with objective measures (see Ackerman, 1997). In a review of the literature, Paulhus, Lysy, and Yik (1998) concluded that the correlations between single-item self-reports of intelligence and IQ scores rarely exceeded .30 in college populations. Recent studies by Furnham and co-workers corroborate these conclusions (Furnham & Chamorro-Premuzic, 2004; Furnham et al., submitted for publication). Furthermore, self-reports of ability may be subject to various systematic biases: Personality traits such as neuroticism may be associated with under-estimation of actual intelligence (Furnham et al., submitted for publication). Questionnaire measures of EI are known to be confounded with personality traits such as extraversion and low neuroticism that bias positive self-perceptions of ability (Matthews et al., 2002), reducing the capacity of the questionnaire to discriminate between groups differing in true competence.

1.5. Social comparison and self-perceptions

One process that may moderate the experience of giftedness is social comparison. Within the social frame of reference model, students' self-perceptions in educational settings are assumed influenced by processes of social comparison (Marsh, 1987; Marsh & Hau, 2003). Accordingly, students compare their own attributes and attainments with those of other students within their own reference group, a process that may, in turn, shape self-perceptions of ability and competence, and perhaps even of emotional intelligence (cf. Schwarzer & Lange, 1983). Social comparison has been shown to influence the

academic and social self-concept and evaluative anxiety of gifted students (Zeidner & Schleyer, 1999a, 1999b), but little work has been done on how assignment of talented children to special classes may influence social comparison. Stereotypic perceptions of "gifted students" in special classes may play a role in determining how these students are perceived by children of their own age, who do not fare so well. Gifted students are often disturbed by these stereotypic perceptions and make elaborate efforts to mask their gifted status by employing such strategies as "playing dumb", "self-berating", and so forth (Coleman, 1985; Cross, Coleman, & Terhaar-Yonkers, 1991). Thus, on one hand, belonging to a separate segregated class for the gifted may enhance perceptions of one's gifted status and aggravate adjustment problems with one's peer group. In this case, self-perceptions of EI might be depressed. Children who accept the stereotype that to be intellectually smart is also to be socially inept and "nerdish" may score lower on questionnaire measures of EI. On the other hand, the homogenous social composition of the gifted class may strengthen group solidarity and provide a supportive peer group that can offset the negative effects associated with giftedness. In this case, gifted children might obtain higher scores on EI questionnaires, such as the SSRI.

1.6. Hypotheses

The preceding review suggests support for the following hypotheses, which we will test in the empirical study that follows:

Hypothesis (1). According to the psychometric model of *g*, academically gifted students are predicted to score meaningfully higher, on average, than their non-gifted counterparts on the MSCEIT—a performance-based measure of EI.

Hypothesis (2). According to the investment model of EI put forward by Zeidner et al. (2003), verbal ability has a meaningful, causal effect on acquisition of emotion-related skills and competencies. Thus, when differences on verbal ability are statistically controlled (by, for example, using hierarchical regression procedures), group differences on the MSCEIT should reduce to non-significance.

Hypothesis (3). Given the modest correlations between self-estimates and psychometric measures of cognitive ability, we would expect the correlation between the SSRI, a self-estimate measure of EI, and the MSCEIT, a performance-based measure of EI, to be reminiscent of the typical correlations ($r = .2$ to .3) between self-rated and objectively-assessed measures of intelligence (e.g., Paulhus et al., 1998).

Finally, social comparison theories are relatively imprecise in predicting whether gifted children will obtain higher or lower scores on the SSRI. In addition, as previously discussed, the SSRI may index personality factors that bias self-perceptions. Because it is difficult to predict group differences between gifted and non-gifted students on self-report measures of EI this part of the study will be more exploratory.

2. Method

2.1. Participants

Participants were 208 students: 83 gifted (57 males, 26 females) and 125 non-gifted (50 males, 75 females) adolescents, drawn from 7th to 10th grade classes in junior-high and high schools in Israel.

Table 1a
Sample distribution by educational group, gender, grade level, and age

Grade	Gifted		Non-gifted		Total
	Male	Females	Male	Females	
7	14	6	12	24	56
8	8	7	11	16	42
9	17	6	18	15	56
10	18	7	9	20	54
Total	57	26	50	75	208

Within the comprehensive school selected for this study, which concentrates gifted students from Haifa and Northern Israel, all students in gifted classes were included in the study, and comparable regular classes were randomly chosen within the school to serve as the control. Because of the various issues raised in the introduction, some indication of further demographic differences evident between these groups would seem warranted. To this end, Table 1a presents the sample distribution by educational group, gender, and grade level, and Table 1b presents the age distribution of the sample by educational group and grade level. As shown in Table 1a, the sample was unevenly distributed by gender, with a meaningfully higher proportion of boys relative to girls in gifted classes within each grade level. The higher proportion of males relative to females in the present sample of gifted students is consistent with a trend observed since the inception of special programs for the gifted in Israel (i.e., the 2 to 1 ratio of males vs. females is commonplace in gifted student programs).

The mean age group for gifted and non-gifted students were comparable within each grade level, save for the 9th grade level, where non-gifted students were shown to be significantly older than gifted students (i.e., $15.11 > 14.81$, $t(54) = -2.91$, $p < .003$). Because age data were obtained post-facto (and on an anonymous basis from school records by class), we could not statistically control for age in the analyses. Notwithstanding, given that abilities are likely to increase with age, these render differences between the groups more telling if in the direction "favoring" gifted students.

2.2. Sample selection: Determination of giftedness

A two-stage process is employed to identify academically gifted students in the Israeli school system. Stage 1 involves group administration of a scholastic aptitude (i.e., screening) test to second and third grade elementary school students. This test is comprised mainly of reading comprehension and mathematical comprehension items. National cut-off scores (based on the top 15% of students in a particular year nationwide) are employed in order to identify those students eligible for the next stage of

Table 1b
Age distribution, by educational group and grade level

Grade level	Gifted			Non-gifted		
	M	S.D.	Range	*M*	S.D.	Range
7	12.88	.36	1.33	13.05	.39	1.76
8	13.88	.22	1.19	13.91	.30	1.41
9	14.81	.31	1.30	15.11	.42	1.81
10	15.98	.38	1.16	16.05	.41	1.83

selection to a gifted program. In addition, teachers are encouraged to recommend additional students who did not reach the cut-off score, yet nevertheless demonstrate a high level of academic talent in their studies. Thus, the first stage is based on a standardized psychometric test as well as teacher recommendations and evaluations.

Stage 2 involves administration of an advanced placement test, aimed at measuring general cognitive ability of the student, which is group-administered for the purposes of final selection of gifted children for special programs. The ability tests used are heavily loaded on verbal and numerical ability, but do *not* gauge other potentially important facets of giftedness, such as: emotional and social competence, specific intellectual and artistic abilities, creativity, leadership ability, and kinesthetic aptitudes. Anywhere from between 1% and 3% of the students taking this test (and obtaining the highest scores in their respective school districts) are then recommended for special enrichment programs. Unfortunately, data concerning the test content and its psychometric properties is confidential and not released to the public by the Henrietta Szold Research Institute, which is responsible for administering the placement test.

2.3. Study measures

Emotional intelligence was measured using both performance-based and self-report approaches, namely the MSCEIT and SSRI, respectively. Verbal ability was assessed by the Vocabulary subtest of the WISC-R-95.[1] A brief, capsule description of these various instruments follows.

2.3.1. Mayer–Salovey–Caruso Emotional Intelligence Test (MSCEIT) (Version 2)

This performance-based assessment consists of eight tasks assessing the four core branches of EI: (1) Perceiving Emotions, (2) Emotional Facilitation, (3) Understanding Emotions, and (4) Managing Emotions (Mayer et al., 2002, 2003). Capsule descriptions of each of two tasks making up a given branch of the MSCEIT are given in Table 2.

2.3.1.1. Scale translation and adaptation. The original English version was translated into Hebrew by two bilingual psychologists (Shani-Zinovich and a co-worker) and then back-translated to English by a third bilingual psychologist (Zeidner), to assure correspondence between the English and Hebrew renditions. A number of minor changes were made in the item content in order to adapt them to the Israeli cultural context. Mainly, typical American names (e.g., Charlie, Ed) were replaced by typical Israeli ones (e.g., Ori, Dani). In addition, the following minor alterations in item content were made so that the items were more appropriate to the social and cultural experiences of adolescents: (a) "After Charlie's *car* was stolen" was replaced by "After Ori's *scooter* was stolen"; (b) "Imagine feeling content on a wonderful day with terrific news about your job" was replaced by "Imagine feeling content with terrific news about succeeding in a *test you took*"; (c) "An executive in a corporation" was replaced with "A vice-principal in Junior High School." Observations of examinees during pilot administration of the MSCEIT suggested that students were typically comfortable with both the language and format of the Hebrew rendition of the MSCEIT.

[1] Note that the WISC-R-95 is standard nomenclature that has been used in the literature to refer to the 1995 Hebrew translation of the Wechsler Intelligence Scale Revised (see e.g., Zeidner, Matthews, & Roberts, 2004).

Table 2
Capsule descriptions of the subtests composing MSCEIT (Version 2)

Test	Task and stimuli	Response
Branch 1: Emotional Identification/Perception		
A. Faces	4 photos of faces, each rated for degree of five possible emotions present: anger, sadness, happiness, disgust, fear, surprise, and excitement	Five-point scale: No (1) to Extreme (5)
E. Pictures	6 pictures of abstract art or photographs of landscapes, each rated for degree of five possible emotions present: anger, sadness, happiness, disgust, fear, surprise, and excitement	Five-point scale of cartoon faces expressing varying degree of a specific emotion
Branch 2: Assimilation of Emotions		
F. Sensations	5 scenarios of two types; EITHER participants are asked to imagine feeling a string of sensations (e.g., cold, slow, sharp), and then match these to 3 emotions that vary across scenarios; OR participants imagine feeling a certain way (e.g., guilty), and then to match this feeling to 3 sensory perceptions (e.g., warm, purple, salty) that vary across scenarios.	Five-point scale: Not Alike (1) to Very Much Alike (5)
B. Facilitation	5 scenarios; participants are asked to judge moods that assist cognitive tasks/behaviors (e.g., What mood might be helpful when composing an inspiring military march?)	Five-point scale: Not Useful (1) to Useful (5) for three moods (e.g., anger, excitement, frustration) that varied across scenarios
Branch 3: Understanding Emotions		
G. Blends	12 items; participants choose combinations of emotions (e.g., Fear, joy, surprise and embarrassment are all parts of?)	Multiple-choice (five-alternatives) (e.g., [a] esteem; [b] awe; [c] puzzlement; etc)
C. Changes	20 vignettes assessing people's understanding of how emotions change in different situations and over time (e.g., Tatiana was annoyed that a coworker took credit for a project and when he did it again she felt?)	Multiple-choice (five-alternatives)
Branch 4: Managing Emotions		
D. Emotion Management	5 vignettes; participants judge actions that are likely to affect the personal feelings of the individual in a given story	Five-point scale: Very Ineffective (1) to Very Effective (5) for 4 alternative courses of action varying across vignettes
H. Emotional Relations	3 vignettes; participants judge actions that are likely to affect the consequences of relationships between people mentioned in a given story	Five-point scale: Very Ineffective (1) to Very Effective (5) for 3 alternative courses of action varying across vignettes

2.3.1.2. Scoring. All tests were proportion consensus-scored with consensus weights determined from the entire (N=208) Israeli high school sample. This approach, which has been used previously in a published scoring study by the current collaborators (see MacCann, Roberts, Matthews, & Zeidner, 2004), has been justified on both empirical and rationale grounds (MacCann et al., 2003), as has the use of consensus-scores per se (see e.g., Legree, 1995; Schulze & Roberts, 2005). The consensus scores we employed in this study reflect the proportion of students in the sample who endorsed each MSCEIT test item. Responses were tallied and students were given credit for responses to the extent that their answers matched those provided by the sample. More specifically, under this scoring technique, a participant who chose "5" in the present investigation, for example, would receive a score of .52 for that item if 52% of

the participants answered that that emotion was definitely present. If the participant reported that that emotion was definitely not present ("1"), and this matched only 5% of the entire sample, then the person would receive a score of .05 for that item, and so forth.

2.3.1.3. Psychometric properties. Measures of internal consistency, as indexed by Cronbach's alpha, were generally acceptable for all measures, though notably these did vary moderately across the two groups, suggesting one should exercise a certain degree of caution in interpreting group differences (whether it be means or correlations). The internal consistency reliability coefficients for the composite MSCEIT test were found to be satisfactory in both gifted (alpha=.87) and non-gifted students (alpha=.88) in the present study. Of note, for the performance-based measures, higher reliability coefficients were obtained for the non-gifted group. Of all the branch scores, Understanding Emotions had the weakest internal consistency, a finding that has been observed previously for the MSCEIT predecessor, the MEIS (see Roberts et al., 2001), suggesting this subtest might benefit from further test development. Moreover, split-half reliability (even–odd) coefficients calculated for each of the 4 branch scores yielded coefficients of .80, .69, .03, and .52 for Branches 1 to 4, respectively, attesting to the problematic nature of Branch 3 scores.

2.3.1.4. Further scoring keys. Our primary analyses of the MSCEIT data (which contribute to the data above and most generally reported throughout this article) were based on consensus scores generated from total group data, which were then applied to both gifted and non-gifted groups. The issue of whether or not this procedure is acceptable remains from some commentators a contentious point, more especially because findings with the MSCEIT may thus be idiosyncratic to a given sample. To allay this potential criticism, we ran further analysis based on a broader normative sample being generated for Israeli students and computed data for the total group based on this key.[2]

2.3.2. Schutte self-report inventory (SSRI)

The SSRI is a self-report inventory in which individuals are instructed to give their level of endorsement to 33 statements describing aspects of emotional life, on a scale ranging from "1" (strongly agree) to "5" (strongly disagree). Exemplary items are: "I know why my emotions change"; "I like to share my emotions with others" (Schutte et al., 1998). The original English version was adapted to Hebrew via translation and back-translation procedures outlined previously for the MSCEIT. The developers of this scale suggest that it provides a measure of general EI, as well as measures of four EI sub-components, namely Emotion Perception, Utilizing Emotions, Managing Self-Relevant Emotions, and Managing Others' Emotions. Of note, however, several researchers have failed to replicate this factor structure (Petrides & Furnham, 2000a; Saklofske et al., 2003). Given the inconsistent subscales reliabilities reported in the literature (Ciarrochi, Chan, & Bajgar, 2001; Schutte et al., 1998), and the satisfactory full score reliability reported for adolescents (.88 for gifted and .83 for non-gifted students in this study), it was decided to use total scale scores only in the current investigation.

[2] We also ran analyses based on consensus data obtained separately from educational (gifted and non-gifted) and gender (male vs. female) subgroups, which will be reported as part of an additional paper that also explores weights derived from other countries. Notably when the MSCEIT protocols for the entire sample were re-scored by male, female, and non-gifted scoring keys, the mean differences between gifted and non-gifted students were highly comparable. While a slightly different picture emerged using the gifted scoring key (all branches showed slight but significant differences), what is fairly impressive is that whatever scoring weight is used, results favored the gifted group of students.

2.3.3. Vocabulary subtest of the Hebrew version of the WISC (WISC-R-95)

This well known test, adapted by Cahan (1998) for Hebrew speaking populations in 1995, consisted of 25 lexical items that examinees were requested to define (e.g., "What is a *watch*?" "What does *coerce* mean?"). Alpha coefficients of .86 were found in both gifted and non-gifted groups. The subtest was group administered during regular classroom period, but was scored individually using standard scoring keys. Examiners assigned scores (0, 1, or 2) to each item according to the judged accuracy of the definition provided by the examinee of each vocabulary item. Two qualified psychologists, with psychodiagnostic training, scored each item using standardized coding instructions appearing in WISC-R-95 manual. Inter-judge validity, based on a random sample of 60 participants, was found to be high, $r = .95$, $p < .001$. In view of the time constraints for test administration and the fact that the Vocabulary subtest is more highly correlated with WISC-R total scores than any of the other subtests (correlations of .68 to .78 across grade levels), the Vocabulary subtest was used as a brief proxy measure of verbal (or crystallized) ability.

2.4. Procedure

Gifted students were taken from gifted classes, whereas non-gifted students were taken from regular classes. Two trained psychologists group administered the paper-and-pencil instruments during regular classes in the following order: MSCEIT, SSRI, and WISC-R-95 Vocabulary. Students responded to the instrument anonymously, with administration time about 90 min. Appropriate ethical procedures, including obtaining informed consent and debriefing all participants involved in the study, were followed.

Since no published norms are available in Israel for the MSCEIT or the SSRI, the global indices for the MSCEIT, SSRI, and Vocabulary scores were standardized to a mean of 100 and S.D. of 15 within this sample. Based on convention in the literature, Branch scores for the MSCEIT have been reported as standardized scores with a mean of 50.00 and standard deviation of 10.00.

3. Results

The present data provide a wide range of possible analyses for addressing the main aims of the investigation. For example, each of the eight sub-tests from the MSCEIT could be analyzed and reported separately, both over the whole group, by educational group and by gender, and combinations thereof (as could each of the facets from the SSRI). However, the main content areas for the performance-based measures, at least from a theoretical standpoint, would appear the four branches and general EI score, while for the SSRI a single score – general EI – alone appears construct valid. In the passages that follow, consideration is given to descriptive and certain inferential statistics related to these constructs, from which point we consider outcomes that are dependent on correlational analyses.[3]

[3] In order to assess whether or not there was anything aberrant in individual subtest data we also performed requisite analyses, and gauged the similarity with published studies. These data, which revealed comparable findings to studies conducted by Mayer and colleagues (e.g., Mayer et al., 2002), are available from the authors upon request.

3.1. Descriptive and inferential statistics

3.1.1. Differences between educational and gender groups on the MSCEIT

As shown in Table 3, gifted students scored higher than the non-gifted adolescents did on the MSCEIT total score. This outcome was statistically significant, $t(206)=2.68$, $p<.001$, with a moderate effect size of .39 sigma units for educational group. Gifted students scored significantly higher than did non-gifted students on two of the four branches: Understanding, $t(206)=4.94$, $p<.001$, and Managing Emotions, $t(206)=2.77$, $p<.01$. A two-way ANOVA for the effects of gender and educational group and interaction effects on the total MSCEIT score showed a significant interaction, $F(1,180)=6.59$, $p<.01$. Whereas females scored higher than males and gifted students higher than non-gifted on the MSCEIT, the significant interaction effects show that gender differences are significantly greater among the normal students than the gifted (see also Table 4). Non-gifted girls scored at about the same level as the gifted boys and girls; the only group that appears different is the non-gifted boys.

Hierarchical multiple regression procedures were used to test whether the group difference on the MSCEIT was statistically dependent upon the group difference in verbal ability, as assessed by the Vocabulary test of the WISC-R-95. When verbal ability was entered first into the regression model, followed by educational group, the model was significant (i.e., $F(2,171)=10.13$, $p<.001$), accounting for about 11% of the MSCEIT score variance. Verbal ability contributed significantly to the MSCEIT score variance: $t(171)=3.56$, $p<.005$, B (*standardized regression coefficient*)=.39. However, educational group failed to contribute significantly to the model once controlling for verbal ability. These outcomes suggest that the observed difference between gifted and non-gifted students is accounted for largely by differences in verbal ability, consistent with the Zeidner et al. investment model.

When a similar hierarchical regression analysis was performed for gender, the model was significant: $F(2,205)=10.10$, $p<.01$, RSQ=.09. The effects of gender were non-significant, while the effects of

Table 3
Variable means, standard deviations, alphas, and effect size, by various groups

	Gifted ($N=83$)			Gifted ($N=125$)			Group ($N=208$)	
	M	S.D.	α	M	S.D.	α	*d*-Score	α
MSCEIT branches								
1. Emotion Perception	50.54	9.10	.84	49.64	10.58	.88	.09	.86
2. Assimilating Emotions	50.55	9.56	.69	49.63	10.30	.71	.08	.70
3. Understanding Emotions	53.98	7.01	.41	47.36	10.81	.63	.75*	.61
4. Managing Emotions	52.32	8.97	.84	48.46	10.38	.88	.40*	.86
Total scores								
Performance EI (MSCEIT)	103.36	13.10	.87	97.77	15.79	.88	.39*	.87
Self-Report EI (SSRI)	95.17	14.87	.88	103.47	14.17	.83	−.57*	.87
Vocabulary (WISC-R95)	112.99	8.85	.86	90.16	10.54	.86	2.35*	.86

(1) MSCEIT=Mayer–Salovey–Caruso Emotional Intelligence Test; SSRI=Schutte Self-report Inventory; WISC-R-95=Wechsler Intelligence Scale for Children: Revision (in Hebrew, 1995).
(2) MSCEIT branches have a standardized mean of 50 (S.D.=10), while total scores on all tests are expressed as a standardized mean of 100 (S.D.=15); thus group means for the entire sample are not reported.
(3) *d*-Score=(Gifted mean − Non-gifted mean)/Average within-group S.D.s.
* Significant at $p<0.05$.

Table 4
Means and S.D.s by educational group and gender

Measure	Gifted				Non-gifted			
	Male ($N=57$)		Female ($N=26$)		Male ($N=50$)		Female ($N=75$)	
	M	S.D.	*M*	S.D.	*M*	S.D.	*M*	S.D.
MSCEIT branches								
1. Emotion Perception	50.29	8.82	51.10	9.84	46.78	10.09	51.55	10.52
2. Assimilating Emotions	50.36	9.11	50.96	10.66	45.93	10.85	52.10	9.19
3. Understanding Emotions	53.84	7.32	54.28	6.41	45.25	10.90	48.76	10.58
4. Managing Emotions	51.53	9.92	54.07	6.19	44.59	10.64	51.03	9.42
Total scores								
Performance EI (MSCEIT)	102.74	12.44	104.73	14.63	91.41	15.52	102.01	14.58
Self-Report EI (SSRI)	95.34	15.31	94.81	14.15	100.21	14.37	105.58	13.74
Vocabulary (WISC-R95)	111.84	9.50	115.58	6.65	88.14	10.60	91.58	10.33

(1) MSCEIT = Mayer–Salovey–Caruso Emotional Intelligence Test; SSRI = Schutte Self-report Inventory; WISC-R-95 = Wechsler Intelligence Scale for Children: Revision (in Hebrew, 1995).
(2) MSCEIT branches have a standardized mean of 50 (S.D. = 10), while total scores on all tests are expressed as a standardized mean of 100 (S.D. = 15); thus group means for the entire sample are not reported.

educational group were highly significant: $t(205)=3.64$, $p<.001$, $B=.25$. Overall, these analyses suggest that the observed differences cannot be accounted for by gender, a finding that would also appear reasonable on inspection of the data presented in Table 4.

3.1.2. Additional analysis of consensus scores

Consensus scores (for the present adolescent group) were recalculated based on normative scores for a sample of Israeli students ($N=379$) and are presented in Table 5. The normative sample consisted of 208 females and 171 males who took the Hebrew version of the MSCEIT, with mean age of 18.53 (S.D. = 4.55) and a range between 13 and 25. The overall pattern of results obtained was highly similar to the results obtained from using consensus scores generated from the present sample. Thus similar to what was reported in Table 3, gifted students (M=52.81, S.D.=8.25) scored significantly higher than non-gifted students (M=48.13, S.D.=10.64), $t(206)=3.56$, $p<.01$, by the order of half a standard deviation (cf. the .4 sigma difference for sample-generated consensus scores). Significant differences, in favor of gifted students, were also found for the two strategic EI branches, i.e., Understanding (53.42 (5.82)>47.73 (1.47), $t(206)=4.71$, $p<.05$, and Managing Emotions, (52.50 (8.76)>48.34 (10.45), $t(206)=3.11$, $p<.05$, with differences of about two third and .4 standard deviations among the groups. This closely parallels significant differences found when using sample consensus data, with significant differences in the order of .75 and .4 S.D. reported in favor of gifted students. Furthermore, the MSCEIT correlates are highly reminiscent of the data reported in Table 4. Thus, MSCEIT total scores based on the larger normative data correlated .39 with WISC-R-95 Vocabulary scores and .25 with SSRI scores, compared with sample consensus score correlates of .25 and .32, respectively. In addition, correlations between normative consensus generated and sample-generated consensus scores ranged from .98 to .99 for the branch scores and was .98 for total scores. The fact that weights derived from this normative group led to such high levels of convergence with sample consensus-weights is compelling.

Table 5
Means and S.D.s for MSCEIT scales for gifted and non-gifted students, employing different scoring keys

Scoring key	Emotion Perception	Assimilating Emotions	Understanding Emotions	Managing Emotions	MSCEIT Total
1. Group consensus					
Gifted group					
M	50.54	50.55	53.98	52.32	103.36
S.D.	9.10	9.56	7.01	8.97	13.10
Non-gifted group					
M	49.64	49.63	47.36	48.46	97.77
S.D.	10.58	10.30	10.81	10.38	15.79
d-Scores	.09	.08	.75*	.40*	.39*
2. Normative consensus					
Gifted group					
M	50.98	50.60	53.43	52.50	104.22
S.D.	8.96	9.50	5.82	8.76	12.37
Non-gifted group					
M	49.35	49.60	47.73	48.34	97.20
S.D.	10.62	10.34	11.47	10.45	15.96
d-Scores	.16	.10	.62*	.43*	.64*

(i) The following are details related to the scoring keys: (1) scoring key based on the total adolescent sample tested for this study ($N=208$); (2) scoring key based on normative sample, comprised of high school and college students ($N=379$).
(ii) MSCEIT Branches have a standardized mean of 50 (S.D.=10), while total scores on all tests are expressed as a standardized mean of 100 (S.D.=15).
(iii) *d*-Score=(Gifted mean − Non-gifted mean)/Average within-group S.D.s.
* Differences among educational groups are significant at $p<.05$ level.

3.1.3. Group differences on the Schutte Self-Report Inventory

A two-way ANOVA for the effects of gender and educational group and interaction effects on SSRI scores showed significant effects for: gender, $F(1,180)=9.72$, $p<.002$; and educational group, $F(1,180)=9.72$, $p<.002$; but no significant interaction effects. Thus, males scored higher than females and non-gifted students scored higher than gifted on the SSRI.

In contrast to the pattern of educational group differences found for the MSCEIT, a different pattern of group differences was observed for the SSRI. Accordingly, non-gifted students scored significantly higher on this scale than gifted students, $t(182)=-3.82$, $p<.001$. Can these differences be accounted, in some way, by verbal ability? To answer this question, hierarchical multiple regression analysis was conducted on the SSRI, with verbal ability entered first, along with educational group, as the second predictor. The model showed significant effects, $F(2,171)=7.22$, $p<.001$, accounting for about 8% of the variance in EI scores. Vocabulary did not add significantly to the regression model, while educational group did have a significant effect: $t(171)=2.47$, $p<.02$, $B=.28$. A similar analysis with gender entered first into the model, yielded a significant model: $F(2,181)=8.34$, $p<.001$. Gender, however, did not add significantly to the model; the effects of educational group remained significant: $t(181)=3.28$, $p<.001$, $B=.24$. Thus, the data support the claim that the higher scores of non-gifted students on the self-report measure of EI cannot be accounted for either by gender or by verbal ability.

A focused test for the interaction between educational group, as a between-group factor, and type of EI measure (ability versus self-report), as a within-subject factor, via MANOVA procedures, revealed a

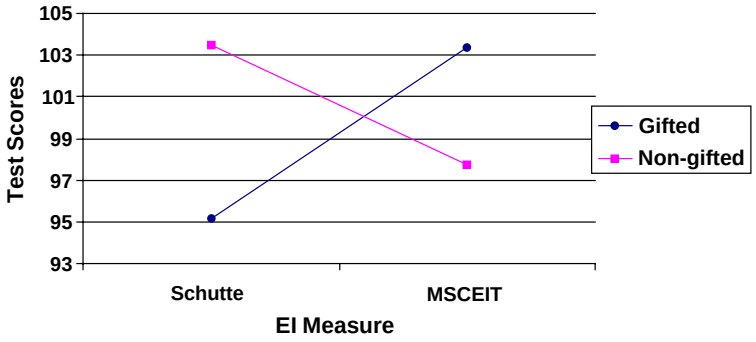

Fig. 1. Interaction between type of educational group (gifted vs. non-gifted) and EI measure (performance vs. self-report, each standardized to $M=100$, S.D.$=15$ within sample).

significant group-by-measure interaction effect: $F(1,182)=32.51$, $p<.001$. Analysis of simple effects showed that gifted students scored significantly higher on the MSCEIT compared with their performance on the SSRI, whereas non-gifted scored higher on the SSRI compared with their performance on the MSCEIT. As noted previously, the size of the group difference on the SSRI, in favor of non-gifted students, is larger ($d=.57$) than the group difference on the total MSCEIT ($d=.39$), in favor of gifted students. This interaction is depicted in Fig. 1.

3.2. Correlational analyses

As shown in Table 6, total scores on the two EI measures, i.e., MSCEIT and the SSRI, correlated positively for the group as a whole ($r=.25$); as well as within both gifted ($r=.27$) and non-gifted ($r=.36$) student subgroups. Verbal ability correlated positively with Total MSCEIT scores, $r=.32$, and in particular with the Understanding ($r=.54$) and Managing Emotions ($r=.28$) branches. These outcomes, along with near zero-order correlations between Vocabulary and both Emotion Perception and Assimilating Emotions, seemingly constitute something of a replicable pattern between crystallized

Table 6
Intercorrelation matrix for key measures for the sample

Measure	Emotion Perception	Assimilating Emotions	Understanding Emotions	Managing Emotions	MSCEIT	SSRI	WISC-R-95
MSCEIT branches							
1. Emotion Perception	1.00						
2. Assimilating Emotions	.53**	1.00					
3. Understanding Emotions	.23**	.28**	1.00				
4. Managing Emotions	.27**	.44**	.42**	1.00			
Total scores							
Performance EI (MSCEIT)	.82**	.74**	.63**	.64**	1.00		
Self-Report EI (SSRI)	.21**	.27**	.03	.24**	.25**	1.00	
Vocabulary (WISC-R-95)	.10	.11	.54**	.28**	.32**	−.21**	1.00

(1) Due to missing data, N varies between 174 and 208.
** $p<0.01$.

Table 7
Intercorrelation matrix for key measures, by educational group

Measure	Emotion Perception	Assimilating Emotions	Understanding Emotions	Managing Emotions	MSCEIT	SSRI	WISC-R-95
MSCEIT branches							
1. Emotion Perception	1.00	.51**	.34**	.23*	.85**	.16*	−.16
2. Assimilating Emotions	.54**	1.00	.28**	.42**	.75**	.22*	−.04
3. Understanding Emotions	.19*	.29**	1.00	.36**	.63**	.18*	.26*
4. Managing Emotions	.29**	.44**	.40**	1.00	.59**	.27*	.01
Total scores							
Performance EI (MSCEIT)	.82**	.75**	.61**	.65**	1.00	.27*	−.03
Self-Report EI (SSRI)	.28**	.35**	.13*	.33**	.36**	1.00	.03
Vocabulary (WISC-R-95)	.23*	.14	.52**	.35**	.41**	−.02	1.00

(1) Gifted (N ranges from 75 to 83) and non-gifted (N ranges from 99 to 125).
(2) Gifted and non-gifted intercorrelations appear above and below main diagonal, respectively.
* $p < .05$.
** $p < 0.01$.

intelligence and facets of EI obtained from performance-based measures (see Roberts et al., 2001). Notwithstanding, when partialling out educational group from the relationship between total MSCEIT score and Vocabulary, the partial correlation was still meaningful, $r = .26$.

From Table 6 it is apparent that Vocabulary was significantly correlated with MSCEIT total score in the non-gifted group, while in the gifted sample the correlation coefficient was close to zero. Indeed, the correlation between vocabulary and MSCEIT was higher for all four branches in the non-gifted group than in the gifted group. A test of the difference between the correlations between vocabulary and MSCEIT total score in the two groups was significant, using Fisher's r to z transformation: the z for the difference was 3.24 ($p < .01$).

By contrast, the self-report measure (i.e., SSRI) correlated negatively with Vocabulary ($r = -.21$). This outcome may be considered a violation of a near lawful principle defining the domain of human cognitive abilities, the existence of positive manifold (e.g., Guttman & Levi, 1991; Jensen, 1998). Notwithstanding, when educational group is partialled out of this relation, the correlation drops to zero. Table 7 gives the correlation matrix separately for non-gifted (bottom diagonal) and gifted (upper diagonal) groups. Consistent with the preceding assertion, within each educational group, the correlation between SSRI and Vocabulary is close to zero.

4. Discussion

This study set out to examine differences in EI between gifted and non-gifted students, and to explore the role of measurement procedures on the direction and magnitude of any observed group differences. The hypotheses listed in the introduction were, by in large, confirmed. Gifted students obtained higher scores on the MSCEIT (Hypothesis 1), and the group difference was statistically dependent upon group differences in vocabulary (Hypothesis 2). We also showed that the MSCEIT and SSRI are only weakly correlated (Hypothesis 3). In addition, we found that mean SSRI score was lower in the gifted group, a finding that, curiously, was in entirely the opposite direction to the group difference on the MSCEIT. In

other words, whether or not gifted vs. non-gifted students differ significantly in emotional intelligence depends entirely on the operationalization of EI. Notwithstanding, we also showed that how consensus was determined did not affect any of the obtained findings using the MSCEIT. These outcomes, of necessity, require that the discussion, which follows, focus on the two forms of assessment – performance-based and self-report – relatively independently. Consideration is given to the theoretical implications of the empirical study, along with future directions for research to address what appear as more vexing issues.

However, before we proceed, a number of caveats and limitations of the present research need to be indicated. First, given the relatively small sample size, coupled with the uneven distributions of the educational groups by gender, there may be insufficient power in our data set, particularly for study of group differences in patterns of correlations. Furthermore, given that this study was carried out in the Israeli educational context, it is unclear whether the results would generalize to non-Israeli samples, although we note that the selection and educational treatment of gifted children is similar to the U.S.A. (Zeidner et al., 2004). It would also be useful for future studies to include real-life criteria for social-emotional adjustment, to complement test scores on EI scales. Finally, a cross-sectional study such as the present one can offer only tentative conclusions on how individual differences in emotional and cognitive development may be inter-related, and there is an evident need for longitudinal studies that test causal hypotheses (Izard, 2001).

4.1. Elevated emotional intelligence in gifted students

When measured using performance-based techniques (i.e., MSCEIT), EI was found to be higher among gifted than among non-gifted high school students, consistent with the view that academic giftedness is generally an asset (rather than a hindrance) to social functioning (e.g., Lubinski & Benbow, 2000). Regression analysis showed that this finding was not an artifact of the difference in gender composition of the groups.

The present data also confirm the role of verbal ability in EI. Vocabulary, which relates closely to Gc, correlated with MSCEIT total score in the whole sample. Mayer et al. (2002, 2003) have drawn a distinction between Experiential (Branch-1 and -2 subtests) and Strategic EI (Branch-3 and -4 subtests), with the latter clearly more linked to the cognitive processing of emotionally salient information. The two branches related to giftedness – Understanding and Managing Emotions – were both correlated with vocabulary when consensus scores were derived from the entire sample. Conversely, Perception and Assimilation of Emotions were unrelated to vocabulary, and did not differ significantly between gifted and non-gifted groups. These data are consistent with the Zeidner et al. (2003) investment model, which suggests that the child's verbal skills contribute to development of emotional competencies. However, they also imply that the developmental trajectory of nonverbal competencies may be rather different. It remains unclear whether verbally-mediated and nonverbal elements of EI should be grouped together as a common factor, or, alternatively, whether a more extensive sampling of competence-related constructs might reveal separable verbal and nonverbal factors. Certainly, there is a need to focus on the disparate theoretical underpinnings of the two so-called "areas" of emotional intelligence: Experiential and Strategic.

In general, data support Spearmanian psychometric models of human cognitive abilities, in demonstrating that students selected for academic giftedness score higher on performance-based measures of EI, and that EI appears to relate to Gc. These data simultaneously bring into question the

veracity of systemic models postulating independent forms of multiple intelligences (see Gardner, 1983). An additional feature of the data was that, within the two groups, MSCEIT scores were correlated with vocabulary only in the non-gifted group. This finding is reminiscent of the "Law of Diminishing Returns", which states that the correlations between different abilities are stronger at lower levels of intelligence than they are at higher levels of intelligence (e.g., Jensen, 2003).[4] It is also consistent with the Zeidner et al. (2003) investment model, which states that verbal ability operates as a constraint on the development of social–emotional skills, but does not necessarily influence skill acquisition directly.

Analysis of the MSCEIT data confirmed previous findings that, using consensus scoring, females obtain higher scores than males (e.g., Roberts et al., 2001). However, the higher MSCEIT scores of the predominantly male gifted group could not be attributed to this gender difference. Moreover, the significant interactive effect of giftedness and gender on MSCEIT scores revealed an unexpected result: Gender differences were more pronounced in the non-gifted than in the gifted group. Given the relatively small number of gifted girls in this adolescent sample (26), this finding should be interpreted with caution. Nevertheless, one possibility is that gifted males may be able to compensate effectively for lower EI by application of intellect, specifically crystallized abilities. Another possible explanation is that typically, with non-gifted children, parents may invest more effort in the emotional socialization of girls than of boys, leading to higher EI in the former. For example, parent–child conversations are more likely to deal with interpersonal relationships when the child is female (Fivush, Brotman, Buckner, & Goodman, 2000). However, when a boy is labeled as gifted, parents may be motivated to attend to his social and emotional development, because of the common but incorrect belief that academic giftedness leads to social–emotional difficulties, raising EI.

Thus far, we have assumed that the MSCEIT does indeed assess genuine abilities (Mayer et al., 2000). However, as we have discussed elsewhere at length (Matthews et al., 2002), it is unclear exactly what is measured by tests of this kind, and despite good agreement of different scoring methods in a recent study (Mayer et al., 2003), doubts remain about whether scoring is veridical (Roberts et al., 2001). One possibility is that the MSCEIT assesses general declarative knowledge about emotions, of the kind that might be obtained from a school or university psychology course, such as hopelessness being a cause of depression: i.e., explicit, rather than implicit, knowledge. If so, the present results may reflect gifted children's overall advantage in general knowledge, rather than any special facility in understanding and managing emotion. Academic knowledge of the causes of depression, for example, does not necessarily translate into procedural skills for alleviating depression in self and others. Future research might usefully investigate the extent to which gifted children are able to benefit from whatever capabilities are assessed by the MSCEIT in academic and interpersonal settings. As Boyatzis (personal correspondence, 2004) suggests, 360 assessments may provide a better indication of which EI abilities are actually used in various settings.

Another possibility (Matthews et al., 2002), linked to the use of consensus scoring, is that the MEIS and MSCEIT assess a kind of cultural conformity, i.e., holding beliefs about emotion that are congruent with cultural norms. Such "goodness of fit" might well be adaptive, but it does not represent a personal ability or aptitude. Perhaps the present results reflect greater socialization of gifted children. Delinquent groups are generally of lower IQ (Zeidner & Matthews, 2000), and, in addition, teachers may be

[4] It should be noted that Spearman's law of diminishing returns is conventionally addressed by analyzing norming data associated with a battery of scales. One scale is used to define groups and other scales correlated within groups.

reluctant to recommend that troublesome children be considered in programs for the gifted. Thus, although the data are generally consistent with some overlap between academic and emotional aptitudes and contrary to Gardner's multiple intelligence theory, further work should also investigate alternative explanations.

4.2. Depression of self-perceptions in gifted students

The correlation between the MSCEIT and SSRI is reminiscent of the typical correlation of .2 to .3 between self-rated and objectively-assessed measures of intelligence (e.g., Paulhus et al., 1998). Thus, given the typically modest correlations found between self-estimate and performance measures of ability, the lack of meaningful relationship between the MSCEIT and the SSRI may be reasonable. The analyses of the SSRI also reinforce existing doubts about the validity of questionnaire indices of ability. The correlation of .25 between MSCEIT and SSRI total scores was significant, but, similar to comparable work (Brackett & Mayer, 2003) and seemingly far too low to indicate convergent evidence for validity. Performance-based and self-report constructs appear to be largely distinct from one another, and self-reports should not be used as proxies for objective tests.

Perhaps it could be argued that it is the SSRI rather than the MSCEIT that assesses a truly separate "multiple intelligence" distinct from IQ and academic giftedness. It remains open to debate how much various capabilities and talents beyond *g* should overlap with cognitive intelligence (Gardner, 1983). Against this hypothesis, there is little evidence that suggests the SSRI and similar questionnaires assess a true ability as opposed to a personality disposition (Petrides & Furnham, 2000b). In particular, most of the validation studies have used subjective rather than behavioral criteria, and failed to control for relevant personality factors that overlap with self-assessed EI (see Matthews et al., 2002, for a review). However, the relationship between perceived and actual competence remains important; one fruitful avenue for future research may be the comparison of self-and other-ratings, as performed by 360 assessments such as that of Boyatzis et al. (2000).

When measured using a self-report assessment (i.e., SSRI), EI was actually lower for gifted students in comparison with the non-gifted. How might one account for the higher scores of non-gifted students on the self-report measure? There is no definitive answer possible, but we briefly describe some suggestions for future research. First, as the social frame of reference model (Marsh & Parker, 1984) suggests, social comparison processes might influence the self-perceptions of gifted students. Perhaps these children do indeed see themselves as set apart from normal social interaction by virtue of being gifted. The transition from being a "big fish in a small pond" to a lesser fish in the pool of gifted children may have adverse effects on self-concept. Second, it is known that the SSRI correlates with personality factors that may differ between gifted and non-gifted groups, such as extraversion and neuroticism (Saklofske et al., 2003). There is no simple association between the known personality correlates of the SSRI and the personal qualities of gifted children (see Zeidner & Matthews, 2000), but the personality attributes related to the SSRI have not been extensively explored. The scale may pick up some elements of personality that relate to non-giftedness, such as high levels of agreeableness. Third, the negative correlation between SSRI and giftedness may be mediated by insight. Perhaps a high SSRI score in part reflects a rather naive over-assessment of one's personal qualities and social skills. If so, gifted children may have better insight into their own personal limitations, leading to lower SSRI scores. One possible explanation that can be eliminated is that the effect of giftedness is an artifact of gender differences on the SSRI. We replicated Schutte et al.'s

(1998) finding by showing that adolescent girls obtain higher scores, but the group effect on SSRI scores remained constant with gender statistically controlled.

5. Conclusion

This study adds to existing knowledge of both emotional intelligence in gifted youth and the nature of EI and EI assessment. Children selected for academic aptitude also show enhanced emotional capability, as assessed by the MSCEIT, but also a possible lack of confidence in their emotional skills, as indexed by the SSRI. High verbal ability may contribute, modestly, to the development of verbally-mediated emotional competencies, although the nature of causal relationships between cognitive and emotional skills requires further research. Insofar as assessment of EI is concerned, the present data are consistent with other findings suggesting that objective tests are preferable to self-reports, although substantial difficulties in conceptualization and test scoring remain (Matthews et al., 2002). Objective ability may modestly influence self-reports, but it is striking that the SSRI is more strongly correlated with personality variables (Saklofske et al., 2003) than it is with the MSCEIT. However, while the MSCEIT might appear to be the instrument of choice for further work, the SSRI, along with established personality measures, may be useful in investigating children's confidence in their own social–emotional capabilities.

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