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Author(s): John D. Mayer, Peter Salovey and David R. Caruso

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## Emotional Intelligence: Theory, Findings, and Implications

**John D. Mayer**

*Department of Psychology  
University of New Hampshire*

**Peter Salovey**

*Department of Psychology  
Yale University*

**David R. Caruso**

*Work-Life Strategies*

Many people have expressed opinions about the scientific viability of emotional intelligence (EI). EI has been said to matter twice as much as IQ (Goleman, 1998, p. 31). Yet, it has been labeled an “elusive concept” (Davies, Stankov, & Roberts, 1998, p. 989). It has also, according to some, “proven resistant to adequate measurement” (Becker, 2003, p. 194). Others have claimed that a “considerable body of research” suggests that EI provides the basis for competencies important “in almost any job” (Cherniss, 2000, p. 10). But, “EI appears to be more myth than science ...” (Matthews, Zeidner, & Roberts, 2002, p. 547). The study of EI even raises the question of whether there can be too many intelligences (Holland & Sternberg, 2000).

Part of the apparent diversity of opinion on EI reflects a divide in the field. Initial, broad public exposure to EI or “EQ,” was the result of a series of newspaper and magazine articles (e.g., Gibbs, 1995) that drew on a tradebook about EI (Goleman, 1995). These naïve representations are sometimes reacted to by psychologists who are concerned that some of the popular ideas will be taken seriously by other psychologists (e.g., Davies et al., 1998; Epstein, 1998).

These popularizations equated EI with everything from “zeal and persistence” (Goleman, 1995, p. 285) to general “character,” (Gowing 2001, pp. 89–90). Measures associated with such perspectives identified EI with such qualities as reality testing, independence, and long lists of work-related competencies (Bar-On, 1997; Gowing, 2001). These conceptualizations and associated measures often have little or nothing specifically to do with emotion or intelligence and, consequently, fail to map onto the term *emotional intelligence*. Those who have employed such approaches increasingly acknowledge that their scales assess self-reports of something considerably broader than EI (Bar-On, 2000, p. 364). Unsurprisingly, such measures overlap with existing scales of personality and are highly correlated with them (Bar-On, 1997; Brackett & Mayer,

2003; Davies et al., 1998; Newsome, Day, & Catano, 2000).

In contrast, our view of EI takes the emotional intelligence terminology seriously. We define EI as

the capacity to reason about emotions, and of emotions to enhance thinking. It includes the abilities to accurately perceive emotions, to access and generate emotions so as to assist thought, to understand emotions and emotional knowledge, and to reflectively regulate emotions so as to promote emotional and intellectual growth (e.g., Mayer & Salovey, 1997).

EI from this theoretical perspective refers specifically to the cooperative combination of intelligence and emotion (e.g., Ciarrochi, Chan, & Caputi, 2000; Mayer & Salovey, 1997; Roberts, Zeidner, & Matthews, 2001). Here, one finds no unusual claims for the potency of EI; quite the contrary, researchers seek to expose popular claims as unfounded, given the evidence thus far (e.g., Davies et al., 1998; Mayer, 1999; Mayer, Salovey, & Caruso, 2000b). Our own research, and that of many other researchers, fits within these bounds.

We view EI as a member of a class of intelligences including the social, practical, and personal intelligences that we have come to call the *hot* intelligences (Mayer & Mitchell, 1998; Mayer & Salovey, in press). The label refers to the fact that these intelligences operate on hot cognitions—cognitions dealing with matters of personal, emotional importance to the individual (Abelson, 1963; Zajonc, 1980).

In the next section of this article, we describe the nature of EI, as well as the four-branch model of EI we have developed, and the measurement instruments we use to study it. In the Controversies and Findings section, we examine the growing evidence that EI exists, that it satisfies many of the criteria that identify an intelligence, and that it predicts matters of consequence. In the Discussion section, we summarize what is now known about people who vary in EI and suggest what can be done to move the field forward.

## Background

### Context for the EI Concept

There are a number of general cultural influences that serve as a context for our thinking about the relation between emotion and cognition. These include the ancient Greek Stoic idea that reason was superior to emotion (described in Payne, 1986; Solomon, 2000, p. 5), the European Sentimentalist movement's idea that there existed innate, pure, emotional knowledge (Reddy, 2001), the Romantic movement's emphasis on emotional expression in the arts (Solomon, 2000), and the political turmoil of the 1960s and the public discussion it elicited of the proper balance between feeling and thought (for a review, see Mayer, Salovey, & Caruso, 2000a). Debates as to the relative importance and rationality of emotion and cognition were carried on within modern psychology (e.g., Leeper, 1948, p. 17; Young, 1943, pp. 457–458) and philosophy (DeSousa, 1987; Nussbaum, 2001).

In the 1980s, growing research in psychology concerned the normative interaction of emotion and thought (e.g., Bower, 1981; Clark & Fiske, 1982; Isen, Shalcker, Clark, & Karp, 1978). Although many interactions between emotion and cognition are relatively neutral in regard to intelligence (e.g., Forgas, 2001), other interactions appeared more germane to the idea that emotions interact with thought in productive ways (for a review, see Mayer, 2000). For example, some researchers examined whether depression enhanced realistic thinking (Alloy & Abramson, 1979), and others examined whether some people regulate their emotions more effectively than others (Isen et al., 1978). In clinical practice, patient groups were identified who had difficulty expressing their emotions (Sifneos, 1975; Taylor, Ryan, & Bagby, 1985). In computer science, artificial intelligence researchers developed expert systems that included emotional understanding; they developed what might be called an *artificial* EI (Dyer, 1983; Mayer, 1986; Picard, 1997; Sloman & Croucher, 1981). Neuropsychological studies of the interrelation of emotion and cognition also reflected the increased interest in the interaction of these processes (Cacioppo, 2002; Damasio, 1994; TenHouten, Hoppe, Bogen, & Walter, 1985).

### The Theory of Emotional Intelligence

The term *emotional intelligence* itself was used in the 1960s in an incidental fashion in literary criticism (Van Ghent, 1961) and psychiatry (Leuner, 1966). Two decades later, it was employed more extensively in a dissertation (Payne, 1986). In 1990, we wrote two articles on EI that explicitly defined EI and developed a theory and demonstration measure of it (Mayer,

DiPaolo, & Salovey, 1990; Salovey & Mayer, 1990); we also editorialized for its further study (Mayer & Salovey, 1993).

To address the concept of EI seriously, one must understand something about both intelligence and emotion. It is to those concepts and their interconnection that we next turn.

**Intelligence.** The study and measurement of EI has its roots in the work of such psychometric pioneers as Binet, Thorndike, and Wechsler, among others (Fancher, 1985). Intelligence can be viewed as representing, primarily, the capacity to carry out abstract thought, as well as the general ability to learn and adapt to the environment (Sternberg & Detterman, 1986; Terman, 1921; Wechsler, 1997). This ability is often said to be represented by a common, general factor, or *g* (Carroll, 1993; Detterman, 1983; Spearman, 1927).

Different types of intelligence are often distinguished according to the kinds of information on which they operate (Carroll, 1993; Horn & Cattell, 1966; Wechsler, 1997). For example, verbal-propositional intelligence concerns understanding vocabulary, sentences, and extended textual passages. There exists, too, a perceptual-organizational intelligence that involves the capacity to see patterns, to recognize missing parts of pictures, and to put puzzle pieces together (Wechsler, 1997), as well as a spatial intelligence (Shea, Lubinski, & Benbow, 2001).

Our own thinking about EI was influenced by the call to broaden the study of intelligence by attending to multiple specific intelligences (Gardner, 1983; Sternberg, 1985; Wechsler, 1950). We are particularly interested in hot intelligences (Mayer & Mitchell, 1998; Mayer & Salovey, 2004) that operate on social, practical, personal, and of course, emotional information (Ford & Tisak, 1983; Gardner, 1983; Lee, Wong, & Day, 2000; Mayer, Salovey, & Caruso, 2000b; O'Sullivan, Guilford, & deMille, 1965; Salovey, Mayer, & Caruso, 2002; Sternberg, Wagner, Williams, & Horvath, 1995).

**Emotion and emotional information.** We conceive of EI, therefore, as operating on emotional information. But what is that, precisely? The philosophical—and later evolutionary—view is that emotions govern, and often signal, motivated responses to situations (Darwin, 1872/1998; Ekman, 2003; Izard, 1993; Spinoza, 1675/1959). Emotion taxonomies have proposed anywhere from two dimensions or categories of emotions to six, to eight or ten (Ekman & Friesen, 1975; Izard, 1993; Plutchik, 1984; Russell, 1980). Specific emotions are believed to arise in response to appraisals of different categories of relationships (Davitz, 1969; Lazarus, 1994; Ortony, Clore, & Collins, 1988; Roseman, 1984). In par-

ticular, such relationships involve those important to survival and reproduction including “threats, attacks, ... courtships, isolation ..., greetings, appeasement, and play.” (Plutchik, 1994, p. 20).

Each emotion conveys a unique set of identifying signals—emotional information (Buck, 1984; Ekman, 1973; Izard, 1993; Scherer, 1993; Scherer, Banse, & Wallbott, 2001). This emotional information may be conveyed through its own unique communication channels, as well as through a unique pattern of associated signals from proprioceptive, affective, and cognitive channels (Damasio, 1994; Izard, 1993, 2001; Scherer, 1993). Such emotional signals communicate information about the individual’s appraisals and motivated reactions to relationships and their vicissitudes.

#### **Emotional and other information compared.**

Emotional information processing is an evolved area of communication among mammals, like human language. It is different from language, however, in being more circumscribed—that is, it involves understandings of relationships among people and, to a lesser extent, animals—rather than the more general types of relationships that other kinds of verbal communication can address (Mayer, Salovey, Caruso, & Sitarenios, 2001).

A further difference between emotional information and general language is their respective degrees of institutionalization. The institutionalization of information refers to the degree to which a culture recognizes information as important, records its meanings, and acknowledges expertise in the area (Mayer et al., 2001). Verbal-propositional intelligence is highly institutionalized. There are grade-school primers on language and on aspects of language understanding. Emotional information is an emerging information source in this regard. Emotional meanings have been understood in earlier times (though they are better understood now), and yet they are only now being communicated in, say, guidebooks for school teachers (Elias et al., 1997). The least institutionalized information area, by definition, is that associated with practical intelligence, which operates on information that is tacit or unstated (Sternberg et al., 1995; Wagner, 2000). To institutionalize such knowledge (beyond access to a privileged few) would change it from tacit to explicit.

**EI and the four-branch ability model.** In our reviews of the existing psychological literature, we have found it convenient to divide the abilities and skills of EI into four areas: the ability to (a) perceive emotion, (b) use emotion to facilitate thought, (c) understand emotions, and (d) manage emotion. These four areas became known as the four-branch model, af-

ter an earlier figure we employed (Mayer & Salovey, 1997).

The order of the branches, from perception to management, represents the degree to which the ability is integrated within the rest of an individual’s major psychological subsystems—that is, within his or her overall personality (Mayer, 1998, 2001). Thus, the perception and expression of emotion (Branch 1), and the capacity of emotion to enhance thought (Branch 2) are relatively discrete areas of information processing that we expect to be modularized or bound within the emotion system. By contrast, emotion management (Branch 4) must be integrated within an individual’s overall plans and goals. Within each branch there also is a developmental progression of skills from the more basic to the more sophisticated (see Mayer & Salovey, 1997).

Branch 1, as noted, reflects the perception of emotion and involves the capacity to recognize emotion in others’ facial and postural expressions. It involves nonverbal perception and expression of emotion in the face, voice, and related communication channels (Buck, 1984; Ekman & Friesen, 1975; Nowicki & Mitchell, 1998; Scherer et al., 2001).

Branch 2, facilitation, involves the capacity of emotions to assist thinking. Most emotion theories include a *feeling* component (Davitz, 1969; Schwarz, 1990), and many discuss the existence of distinctive physiological signs of some emotions. Part of intelligence involves developing a knowledge base about such experiences on which the intelligence can draw (Cytowic, 1993; Mayer & Mitchell, 1998). Knowledge of the link between emotions and thinking can be used to direct one’s planning (Izard, 2001). For example, some types of problem solving are specifically facilitated by some emotions but not others (Erez & Isen, 2002; Isen, 2001; Palfai & Salovey, 1993).

Branch 3, the understanding of emotion, reflects the capacity to analyze emotions, appreciate their probable trends over time, and understand their outcomes (Frijda, 1988; Lane, Quinlan, Schwartz, Walker, & Zeitlin, 1990; Ortony et al., 1988; Roseman, 1984). The developmental aspect of Branch 3 coincides with the growth of language and propositional thought. For example, in terms of Branch 3 (understanding), even a 2-year old may be emotionally apprehensive if she breaks her parents’ favorite lamp (Lewis, 2000). At the same time, a 6-year-old will easily surpass the 2-year-olds’ capacity at labeling and discriminating among feelings, whereas a 30-year-old may well do even better.

Branch 4 reflects the management of emotion, which necessarily involves the rest of personality. That is, emotions are managed in the context of the individual’s goals, self-knowledge, and social awareness (Averill & Nunley, 1992; Gross, 1998; Parrott, 2002). Even small children are often taught to “count to 10” before getting mad or to “smile for Grandpa.” By early

adulthood, the means of emotional self-management have grown, including abilities to avoid feelings or to reframe appraisals to reassure oneself or achieve equanimity (e.g., Erber, 1996; Larsen, 2000; Tice & Bratslavsky, 2000; Wenzlaff, Rude, & West, 2002).

**The Mayer–Salovey–Caruso Emotional Intelligence Test (MSCEIT).** We have constructed a series of scales to measure EI (Mayer, Caruso, & Salovey, 1999; Mayer et al., 1990; Mayer & Geher, 1996). The most recent of these is the MSCEIT (Mayer, Salovey, & Caruso, 2002). The MSCEIT has eight tasks: two to measure each of the four branches of EI.

Branch 1, Perceiving Emotions, is measured through (a) Faces, for which participants are asked to identify the emotions in faces (e.g., Abe & Izard, 1999; Buck, 1976; Campbell, Kagan, & Krathwohl, 1971; Ekman, 2003; Ekman & Friesen, 1975); and (b) Pictures, for which participants are asked to identify the emotions conveyed by landscapes and designs (Arnheim, 1974; Mayer et al., 1990; Rosenhan & Messick, 1966).

Branch 2, Using Emotions to Facilitate Thought, is measured by (c) Sensations, for which participants compare emotions to other tactile and sensory stimuli (e.g., Davitz, 1969; Fromme & O'Brien, 1982; Rimé, Philippot, & Cisamolo, 1990); and (d) Facilitation, for which participants identify the emotions that would best facilitate a type of thinking (e.g., planning a birthday party; Erez & Isen, 2002; Isen, 2001; Palfai & Salovey, 1993).

Branch 3, Understanding Emotions, is measured through (e) Changes, which tests a person's ability to know under what circumstances emotional intensity lessens and increases and how one emotional state changes into another (e.g., frustration into aggression; Ortony et al., 1988; Roseman, 1984); and (f) Blends, which asks participants to identify the emotions that are involved in more complex affective states (Plutchik, 1984).

Branch 4, Managing Emotions, is measured through (g) Emotion Management, which involves presenting participants with hypothetical scenarios and asking how they would maintain or change their feelings (Gross, 1998; Thayer, 1966); and (h) Emotion Relationships, which involves asking participants how to manage others' feelings so that a desired outcome is achieved (e.g., Chapin, 1942; Ford & Tisak, 1983).

### Controversies and Findings Regarding EI

We have argued that EI meets standards for a traditional intelligence. By that, we mean that EI meets three broad criteria (Gardner, 1993; Mayer, 1999; Mayer et al., 2001). First, EI test items can be operationalized in such a fashion that there are more-or-less correct answers. Second, EI shows specific patterns of correlations similar to those of known intelligences. Notably, the mental tasks should de-

scribe a factorially unified domain. In addition, EI should correlate with other intelligences, but only modestly so. Finally, EI should develop with age. We present evidence supporting these criteria here. An equally important focus at this point, however, is on what EI predicts and what the high EI person is like (Matthews et al., 2002). Research with scales such as the MSCEIT and its precursor, the MEIS, helps to address such issues.

At the same time, others have raised questions concerning our theory and measure of EI and its adequacy. These questions also are examined in the following section, and serve to organize some of our comments.

### Can EI Be Operationalized as an Ability?

**Do EI test items have a "right" answer?** For tests of EI to be considered true tests of intelligence, they must have answers that can be evaluated as more or less correct. For example, if a person is asked, "Which two emotional experiences might blend together in the feeling of contempt?" some of the possible answers (e.g., anger and disgust) must be better than others (e.g., joy and challenge). Several methods can be employed to determine the correctness of an answer.

One such method uses the general consensus of test-takers. According to our theory of EI, the general consensus should identify the optimal answer to many EI questions. This makes sense because emotions are evolved signals, and the majority of the group should appreciate the meaning of most of these messages. Therefore, if a person selects an alternative chosen by 75% of the group, the individual's score is incremented by .75 and so on. The group, of course, can be wrong. For that reason, it is important to examine possible alternatives to such a scoring procedure.

A second method for evaluating the correctness of test responses is according to an expert criterion in which experts judge the correct answers to a test. That method, too, showed promise in initial studies (Mayer et al., 1999). Recently, however, some researchers noted that expert scoring, as developed for the MEIS, created scores that were unsettlingly different from general scoring (Roberts et al., 2001). In fact, in our original study on the MEIS, expert and general scoring correlated between  $r = .43$  to  $.78$  (Mayer et al., 2001). We noted that the lack of convergence was likely due to the use of only two expert raters for roughly 2,000 test alternatives (5 alternatives, typical, for each of 400-plus items).

To investigate the potential convergence between expert and general consensus, the MSCEIT expert scoring was based on a larger number of emotion experts. Twenty-one scholars and researchers with specialties in emotion, who attended the biannual conference of the International Society for Research on Emotion, completed the MSCEIT. Minimally, such

a group can be expected to be conversant with how emotion is portrayed and expressed (e.g., in faces), to have a rich and sophisticated emotions vocabulary, and to know the conditions that elicit emotions.

In this investigation, the correspondence between the percentage of experts who chose a given alternative and the percentage of a general sample across the 705 alternatives of the test was extremely high,  $r = .91$ . Test scores on the MSCEIT, calculated by either general or expert scoring, correlated between  $r = .96$  and  $.98$  (Mayer, Salovey, Caruso, & Sitarenios, 2003). These and other relevant values are reproduced in Table 1.

**Are written EI items ecologically valid?** Ecological validity refers to how well a test or laboratory situation can generalize to situations in real life. Written and visual items about emotional information are intrinsically ecologically valid to the extent that some emotional information is communicated through writing and photographs. Geher, Warner, and Brown (2001) examined whether people who exhibited accurate emotional perception and understanding had abilities that extended to the accurate perception of emotion in a real life target.

To test this idea, they recruited a group of the 20 highest scoring and 20 lowest scoring students on a measure of EI understanding from a sample of 124 undergraduates. The 40 students then watched videotapes of graduate students describing what was on their minds. High EI-scoring participants, relative to low-scoring individuals, were significantly better able to identify how the graduate students were feeling. In

contrast, the participant's self-reported empathy was unrelated to such ability (Geher et al., 2001, Table 3).

Such findings suggest that people are able to discriminate between better and worse answers to emotional problems. Different methods converge to a single criterion jointly endorsed both by the majority of participants and by a group of highly selected emotions experts. In addition, this ability may generalize to laboratory conditions that more closely approximate real life settings.

**Are Tests of EI Reliable?**

A review of early measures of EI concluded that “objective measures of emotional intelligence suffer from poor reliability” and went on to state that possible improvements would depend on “complex and arduous” work (Davies et al., 1998, p. 1013). More recently, a discussion of the MEIS and MSCEIT was followed by the statement that “the reliabilities of these performance-based scales, in almost every instance, are far from optimal ... from the perspective of making valid inferences of a ... scientific nature” (Matthews et al., 2002, p. 198). Another article proceeded “the reliability of the subtests that form the highest branches of the model, and thus probably the most important components of the MEIS ... is among the worst in the battery” (Roberts et al., 2001, p. 224). Elsewhere, however, the same authors acknowledge that “the MEIS/MSCEIT provide an overall assessment of EI that has high internal consistency (reliability) ...” (Matthews et al., 2002, p. 516).

**Table 1. Reliabilities of the MSCEIT and Convergence Across Scoring Methods**

<b>Total Test Level</b>			
<b>Area Level</b>			
<b>Branch Level</b>			
<b>Individual Tasks</b>	<b>Mayer et al., (2003) Expert<sup>a</sup></b>	<b>Mayer et al., (2003) Consensus<sup>a</sup></b>	<b>Mayer et al., (2002) Consensus-Expert Agreement</b>
<b>Total test</b>	<b>.91</b>	<b>.93</b>	<b>.98</b>
<b>Experiential area</b>	<b>.90</b>	<b>.90</b>	<b>.98</b>
<b>Perceiving</b>	<b>.90</b>	<b>.91</b>	<b>.98</b>
Faces	.82	.80	.97
Pictures	.87	.88	.93
<b>Facilitating</b>	<b>.76</b>	<b>.79</b>	<b>.97</b>
Facilitation	.63	.64	.98
Sensations	.55	.65	.95
<b>Strategic area</b>	<b>.86</b>	<b>.88</b>	<b>.97</b>
<b>Understanding</b>	<b>.77</b>	<b>.80</b>	<b>.98</b>
Changes	.68	.70	.99
Blends	.62	.66	.98
<b>Managing</b>	<b>.81</b>	<b>.83</b>	<b>.96</b>
Emotional management	.64	.69	.97
Emotional relationships	.64	.70	.94
<i>N</i> for analyses	2015–2111	2015–2112	5000

*Note.* MSCEIT = Mayer–Salovey–Caruso Emotional Intelligence Test.

<sup>a</sup>At the total, area, and branch levels, split-half reliabilities are employed to accommodate for item heterogeneity (e.g., equal numbers of items of each task are placed on each half). Task level reliabilities are coefficient alphas.

Examining the actual MSCEIT reliabilities can shed light on these apparent contradictions. The MSCEIT produces four branch scores that correspond to the Perceiving, Using, Understanding, and Managing aspects of our model. Two tasks are employed to assess each branch of the model. In addition, we divide EI into an Experiential Area consisting of Branches 1 and 2 and a Strategic area consisting of Branches 3 and 4. The total EI test score indexes a participant's performance across all test areas.

When we employ the MSCEIT (or MEIS) for validity studies or interpret them in providing feedback to individuals, we focus on scores at the Total, Area, and Branch levels (Mayer et al., 2002). The test manual explicitly warns that if task level scores are employed, they should be interpreted with caution due to their lower reliability (Mayer et al., 2002, pp. 14, 19, 35).

Reliabilities at all levels of the MSCEIT are reported in Table 1. The recommended scores—those we and others employ—are in bold. The MSCEIT's overall reliability is  $r = .91$  or  $.93$  (depending on whether expert or general consensus scoring is employed), with area reliabilities of  $r = .86$  to  $.90$ , and branch scores representing the four-branch model of  $r = .76$  to  $.91$ . The test-retest reliability is  $r = .86$  (Brackett & Mayer, 2003). The MEIS's reliabilities, as reported in four large-sample studies, are in Table 2. Its reliability is comparable to the MSCEIT at the branch and total levels (it had no area-level scoring).

To explain the previously stated comments then: The original criticisms were aimed at our first exploratory measures of EI, developed in 1990 and 1996 for

the purposes of demonstration studies. Those tests, which were very brief, did have reliabilities that were quite modest. The second "far from optimal" quote appears to refer to the individual tasks of the MEIS or MSCEIT—a level at which the scales were not designed to be employed. In the third quote, the authors appear to imply that those individual task scores are the most important of the test. There is little indication that these summary statements took into consideration the test reliabilities of the MSCEIT (or MEIS) at the Branch, Area, and Total EI levels. Nor were Branch, Area, or Total reliabilities raised in any prominent place in or near the passages, making it quite difficult for a reader to independently evaluate the actual reliability of the test (MacCann, Roberts, Matthews, & Zeidner, 2003; Roberts et al., 2001). The last quote, that acknowledges the high internal consistency of the MEIS and MSCEIT, presumably refers to using the tests at the Branch, Area, or Total test levels at which they were intended to be used. We are encouraged by the authors' last quote, which appears to take into account the recommended use of the test.

### Are Tests of EI Valid?

**Do Tests of EI Have Content Validity?** Some researchers have suggested that for tests of EI, "Content Validity is a difficult area, given disputes over the definition and conceptualization of EI and attendant sampling difficulties" (Matthews et al., 2002, p. 46). If one ever designed a test that was intended to operationalize all the possible definitions of EI (or any

**Table 2.** Reliabilities of the MEIS

	Mayer et al. (1999, Table 1, p. 286)	Ciarrochi et al. (2000, Table 1)	Roberts et al. (2001, Table 2)	Caruso et al. (2002, Table 1)
<b>Total Test</b>	<b>.96<sup>a</sup></b>	<b>.90</b>	<b>nr</b>	<b>.95</b>
<b>Perceiving</b>	<b>.96<sup>a</sup></b>	<b>.88</b>	<b>nr</b>	<b>.94</b>
Faces	.89	.82	.81	.85
Music	.94	nr	.84	.87
Designs	.90	.88	.85	.85
Stories	.84	.76	.72	.78
<b>Facilitating</b>	<b>.86<sup>a</sup></b>	<b>nr</b>	<b>nr</b>	<b>.84</b>
Synesthesia	.86	.59	.84	.85
Biases	.70	.67	.66	.60
<b>Understanding</b>	<b>.89<sup>a</sup></b>	<b>nr<sup>b</sup></b>	<b>nr</b>	<b>.74</b>
Blends	.49	.35	.38	.34
Progressions	.51	.46	.37	.31
Transitions	.94	.52	.57	.58
Perspectives	.78	.66	.68	.69
<b>Managing</b>	<b>.81<sup>a</sup></b>	<b>nr</b>	<b>nr</b>	<b>.76</b>
Other	.72	.55	.66	.73
Self	.70	.43	.68	.61
<i>N</i> for analyses	500	134	704	180–183

*Notes.* MEIS = Multifactor Emotional Intelligence Scale; nr = not reported.

<sup>a</sup>Calculated for factor-based scale. <sup>b</sup>An alpha reliability of .70 was reported for joint Understanding and Managing Emotions factor. Due to the heterogeneity of items across the tasks involved, this likely underestimated reliability.

construct), such difficulties would certainly arise. The content validity of a test, however, is more typically evaluated according to the authors' own stated position on the concept. In this case, we clearly described a four-branch ability theory of EI. The MSCEIT samples systematically from each of those four branches, using two tasks to measure each. The tasks themselves have been selected over a decade of study, which included consideration of the conceptual connection of each task to the theory.

**Do Tests of EI Have Reasonable Factorial Validity?** Another related question about EI is whether it is a unitary intelligence and whether it can be divided into four areas of skills as we have suggested. There is general agreement that the MSCEIT and its precursors such as the MEIS yield one-factor solutions, reflecting that the ability can be considered unitary. In addition, it is possible to model the test(s) with two oblique factors, reflecting that it is separable into Experiential EI (including perceiving and using emotions) and Strategic EI areas (including understanding and managing emotions; Ciarrochi et al., 2000; Mayer, Salovey, Caruso et al., 2003). Finally, four-factor solutions reflecting the four branches individually (perceiving, using, understanding, and managing) provide an excellent fit to the tests (Day & Carroll, 2004; Mayer, Salovey, Caruso et al., 2003; Roberts et al., 2001).

**Discriminant validity 1. Is the MSCEIT different from verbal and other intelligences?** EI, then, can be measured as an ability, is reliable, and has an agreed on factor structure. But is it a new intelligence? And, as some have asked, are there, "Too many intelligences?" (Hedlund & Sternberg, 2000, p. 136). We don't know how many intelligences are best to distinguish, but we do know that EI appears to be an intelligence.

For example, in a neuropsychological study, Jaušovec, Jaušovec, and Gerlic (2001) found that those individuals who scored high on EI, as assessed with the MSCEIT, required less cognitive effort to solve problems, as measured by patterns in theta and alpha frequency bands of electroencephalographic activity of the brain. This is a standard pattern for intelligences.

Moreover, EI is surprisingly distinct from other intelligences. The Understanding branch of the MSCEIT and MEIS have the highest correlations with other measures of intelligence, in the  $r = .25$  to  $.35$  range (See Table 3). Correlations with other branches are still lower. Evidence suggests that the MSCEIT's relation to measures of social intelligence may be no higher than its relation to traditional intelligences (Barchard, 2001).

Jensen (2003) recently argued that one attribute of intelligence is that the correlation among abili-

ties— $g$ —is stronger at lower levels of intelligence than higher levels. This pattern was found for the MSCEIT subtasks among a sample of 208 normal and gifted Israeli high school students (Zeidner & Shani-Zinovich, Matthews, & Roberts, 2004).

**Discriminant validity 2. Does the MSCEIT duplicate self-report measures of EI?** With respect to intelligence in general, self-report IQ scales correlate at the  $r = .30$  level or below with actual, ability-based performance measures of intelligence (Paulhus, Lysy, & Yik, 1998). One's perceived intelligence is considerably different from one's actual intelligence. The MSCEIT and MEIS, therefore, are likely to be only weakly associated with self-perceived EI. There is a second reason to expect a disjunction between scales such as the MSCEIT and the many self-report scales of EI: Many self-report measures typically are based on a very different definition of EI than we employ here. Some began as measures of other psychological constructs such as emotional well-being and still retain many scales related to those earlier ideas (e.g., Bar-On, 1997); others are based on our definition, but explicitly blend in popularized ideas (Schutte et al., 1998).

When the MSCEIT was correlated with several other measures of self-reported EI such as the Bar-On EQ-i (Bar-On, 1997), the Scale of Emotional Intelligence (Schutte et al., 1998), or the Occupational Personality Questionnaire 32—Emotional Intelligence Scale (Collins, 2001), it correlated  $r = .21$ ,  $.18$ , and  $-.31$  with them, respectively, indicating weak overlap of ability-based and self-report tests, as expected (Brackett & Mayer, 2003; Collins, 2001, Table 11). The values are shown in Table 4. The Levels of Emotional Awareness Scale is a rater-evaluation system for a person's integrative complexity in perceiving emotion. That scale, also, is only slightly correlated with the MSCEIT,  $r = .15$ , with a sample of 105 (Ciarrochi, Caputi, & Mayer, 2003, Study 1). The MSCEIT (and MEIS) are also only weakly associated with meta-experience measures of mood, which are sometimes considered an index of self-perceived EI,  $r = .01$  to  $.15$  (Lopes, Salovey, & Straus, 2003) and  $r = .29$  (Gohm & Clore, 2002, p. 95).

**Discriminant validity 3. Does the MSCEIT simply duplicate already-existing measures of personality traits?** Schaie (2001) noted, regarding EI, "It is equally important to show that a new set of constructs is not simply ... an alternative way of describing already established personality dimensions ... such as the NEO" (p. 245). And, studying some self-report measures of EI, Davies et al. (1998) pronounced:



**Table 3. Correlations of Ability-Assessed EI With Other Intelligence Measures**

Measure, Study, and <i>N</i>	Total EI	Perceiving Emotions	Using Emotions	Understanding Emotions	Managing Emotions
<b>Verbal IQ</b>					
Army Alpha Vocabulary (Mayer et al., 1999, p. 287) <sup>a</sup> ; <i>N</i> = 500	.36**	.16**	—	.40**	.20**
Verbal SATs (Brackett & Mayer, 2003) <sup>b</sup> ; <i>N</i> = 207	.32***	—	—	—	—
Armed Services Vocational Aptitude Battery–General (verbal-prop.); (Roberts et al., 2001) <sup>a</sup> ; <i>N</i> = 667–669	.27*	.06	.18*	.36*	.27*
<b>Perceptual–Organizational IQ</b>					
Armed Services Vocational Aptitude Battery–Mechanical (perc-org); (Roberts et al., 2001) <sup>a</sup> ; <i>N</i> = 667–669 ASVAB- (I)	.14*	.02	.15*	.20*	.00
<b>General IQ</b>					
Air Force Qualifying Test (Roberts et al., 2001) <sup>a</sup> ; <i>N</i> = 667–669	.32*	.09*	.22*	.40*	.16*
16 Personality Factor Scale B (Pelletieri, 2002) <sup>b</sup> ; <i>N</i> = 107	.23**	–.03	—	.40**	.04
Shipley Institute of Living IQ (Lam & Kirby, 2002, Table 2) <sup>b</sup> ; <i>N</i> = 304	.25**	.05	—	.38**	.11
<b>Social IQ</b>					
O’Sullivan & Guilford measure of Social Intelligence (OGSI) Cartoon Predictions (II); (Barchard, 2001, pp. 106–107) <sup>b,c</sup> ; <i>N</i> = 141–142	—	.09	.01	.12	.11
OGSI Missing Cartoons (II); (Barchard, 2001, pp. 106–107) <sup>b,c</sup> ; <i>N</i> = 141–142	—	.04	.05	.22*	–.03
OGSI Social Translations (II); (Barchard, 2001, pp. 106–107) <sup>b,c</sup> ; <i>N</i> = 141–142	—	.16	.06	.22*	.08

Note. EI = emotional intelligence.

<sup>a</sup>Used the Multifactor Emotional Intelligence Scale. <sup>b</sup>Used the Mayer–Salovey–Caruso Emotional Intelligence Test. <sup>c</sup>In the original dissertation, correlations were reported at the task level only. As a consequence, here each branch is represented by the first-appearing task on the Mayer–Salovey–Caruso Emotional Intelligence Test V1.1. Branch 1: Faces; Branch 2: Synesthesia; Branch 3: Blends; and Branch 4: Emotion Relations.

\**p* < .05. \*\**p* < .01. \*\*\**p* < .005.

**Table 4. Correlations of Ability-Assessed EI With Self-Report or Rater-Coded Measures of EI**

Measure, Study, and <i>N</i>	Total EI	Perceiving Emotions	Using Emotions	Understanding Emotions	Managing Emotions
Bar-On EQ-i (Brackett & Mayer, 2003) <sup>b</sup> ; <i>N</i> = 207	.21**	.07	.17*	.11	.28***
Schutte Scale (Brackett & Mayer, 2003) <sup>b</sup> ; <i>N</i> = 207	.18	.06	.15*	.12	.22**
Occupational Personality Questionnaire 32–EI Scale (Collins, 2001) <sup>b</sup>	–.31	nr	nr	nr	nr
Levels of Emotional Awareness Scale (Ciarrochi et al., 2003) <sup>a</sup> ; <i>N</i> = 105	.15	ns	ns	.20** <sup>a</sup>	ns
Trait Meta-Mood Experience Scale (TMMS) Total (Gohm & Clore, 2002, p. 95) <sup>b</sup>	.29	nr	nr	nr	nr
Trait Meta-Mood Experience Scale (Clarity); (Lopes et al., 2003, in press) <sup>b</sup> ; <i>N</i> = 90–101	.04	.08	–.13	.09	.04
Trait Meta-Mood Experience Scale (Attention); (Lopes et al., 2003, in press) <sup>b</sup> ; <i>N</i> = 90–101	.01	.05	–.10	.04	.05
Trait Meta-Mood Experience Scale (Repair); (Lopes et al., 2003, in press) <sup>b</sup>	.15	.00	.00	.21*	.27*

Notes. EI = emotional intelligence.

<sup>a</sup>Based on reports of the Stories and Perspectives tasks of the Multifactor Emotional Intelligence Scale. <sup>b</sup>Used the Mayer–Salovey–Caruso Emotional Intelligence Test.

\**p* < .05. \*\**p* < .01. \*\*\**p* < .005.

“Little remains of emotional intelligence that is unique and psychometrically sound” (p. 1013).

Indeed, two widely used self-report measures of EI do overlap substantially with personality measures (Bar-On, 1997; Schutte et al., 1998). Regressing the Big Five on the Bar-On EQ-i, for example, yields a multiple  $R(201) = .75$ , and an  $R(201) = .52$  for the Schutte EI scale (Brackett & Mayer, 2003; Schutte et al., 1998). On the other hand, the comparable figure for the MSCEIT and the Big Five is  $R(201) = .38$ .

The precise relations between EI and the Big Five can tell us a little about the characteristics of a high EI individual. Table 5 shows the relation between the MEIS and MSCEIT and each of the five factors. Each correlation represents a weighted mean over five studies. People higher in EI are agreeable,  $r(1584) = .21$ , open,  $r(1584) = .17$ , and conscientious,  $r(1584) = .11$ . The relations for extraversion and neuroticism, although still statistically significant, are lower, at  $r(1584) = .06$  and  $-.09$ , respectively.

**Table 5.** Weighted Mean Correlations Between EI (MEIS and MSCEIT) and the Big Five Personality Traits Across Several Studies (Total  $N = 1584$ )<sup>a</sup>

		Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness
Perceiving	1	-.13*	.10*	.01	.17*	.08*
	2	-.16*	.08	.13	—	.01
	3	.04	.00	.10	.21**	-.06
	4	-.11*	-.05	.18**	.10	.02
	5	.04	.04	.15*	.21**	.05
	$M_w$	-.08**	.05*	.09**	.17***	.04
Using	1	-.13*	.09*	.07	.17*	.09*
	2	-.01	.19*	.19*	—	.19*
	3	-.14*	.09	.13	.12	.21**
	4	-.06	-.11*	.18**	.03	.01
	5	.05	.02	.08	.16*	.05
	$M_w$	-.07*	.06*	.11***	.10***	.10***
Understanding	1	-.15*	.05	.18*	.10*	.11*
	2	.04	.07	.13	—	.00
	3	-.12	.06	.20	.07	-.01
	4	.02	-.15*	.13*	.03	-.01
	5	-.01	-.04	.21**	.08	.00
	$M_w$	.00	.01	.18***	.08**	.04
Managing	1	-.18*	.13*	.13*	.24*	.16*
	2	.01	.18*	.13*	—	.19*
	3	-.08	.19**	.28**	.39**	.19**
	4	.01	-.02	.23**	.16*	.05
	5	.05	.05	.06	.21**	.05
	$M_w$	-.07**	.11***	.15***	.24***	.13***
Total	1	-.18*	.13*	.13*	.24*	.16*
	2	-.06	.16*	.21**	—	.19*
	3	-.02	-.02	.19**	.19*	.04
	4	-.05	-.11	.23**	.11	.02
	5	.02	.03	.17**	.24***	.05
	$M_w$	-.09**	.06*	.17***	.21***	.11***

*Notes.* 1 = Roberts et al. (2001), MEIS & NEO Personality Inventory;  $N = 656-671$ . 2 = Caruso et al. (2002), MEIS & 16 Personality Factor Scale approximation of the Big 5 factor scales (extraversion = extraversion; anxiety = neuroticism; (-) tough-mindedness = openness; self-control = conscientiousness; Agreeableness does not have an adequate corresponding scale and is omitted (Russell & Karol, 1994, p. 85)  $N = 183$ . 3 = Brackett and Mayer (2003): MSCEIT & NEO-PI:  $N = 206-207$ ; a personal communication (7/14/03) supplied the branch-level MSCEIT correlations. 4 = Day and Carroll, (Day & Carroll, 2004): MSCEIT & NEO-PI:  $N = 237$ ; personal communication (7/3/03) supplied the Total MSCEIT correlations. 5 = Brackett et al. (in press), Brackett, Mayer, and Warner (2004);  $N = 302-332$ . MEIS = Multifactor Emotional Intelligence Scale; MSCEIT = Mayer-Salovey-Caruso Emotional Intelligence Test. EI = emotional intelligence.

<sup>a</sup>Inclusion criteria:  $N > 150$ .

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .005$ .

**Table 6.** Relation of EI With Selected Other Scales of Personality

Scale and Subscales	Total EI	Perceiving Emotions	Using Emotions	Understanding Emotions	Managing Emotions
<i>Holland's Self-Directed Search (Caruso et al., 2002)<sup>a</sup></i>					
Realistic	-.05	-.08	-.07	.02	-.02
Investigative	.10	.02	.08	.12	.10
Artistic	-.01	-.01	.05	-.05	.01
Social	.15*	.07	.20**	.07	.16*
Enterprising	-.17*	-.15*	-.06	-.20**	-.03
Conventional	-.07	-.02	-.08	-.05	-.04
<i>Bond Defense Style Questionnaire (Pelletteri, 2002)<sup>b</sup></i>					
Adaptive defense style	.18*	.08	—	.23**	.04
Maladaptive defense style	-.11	-.02	—	-.23**	.07
<i>Questionnaire on Smoking Intentions (Trinidad, Unger, Chou, &amp; Johnson, 2004)<sup>c</sup></i>					
Effective in turning down offers of smoking	-.18*	—	—	—	—
Lower intentions to smoke	-.21*	—	—	—	—
<i>Crowne-Marlowe Social Desirability (Lopes et al., 2003)</i>					
Total score	.11	.09	.01	.08	.15
<i>Fennigstein, Scheier, &amp; Buss's Public-Private Self-Consciousness (Lopes et al., 2003)<sup>d</sup></i>					
Private self-consciousness	-.12	.00	-.11	-.16	-.12
Public self-consciousness	.06	.02	.08	.04	.05
Social Anxiety	-.01	.02	-.02	-.07	.02

Note. EI = emotional intelligence. Caruso et al. (2002) used the Multifactor Emotional Intelligence Scale; all other studies used the Mayer-Salovey-Caruso Emotional Intelligence Test.

<sup>a</sup>*N* = 182–183. <sup>b</sup>*N* = 107. <sup>c</sup>*N* = 416. <sup>d</sup>*N* = 96.

\**p* < .05. \*\**p* < .01. \*\*\**p* < .005.

A few other correlations with personality scales also are of interest and are reported in Table 6. People higher in EI (as an ability) obtain scores on the Holland Self-Directed Search indicating they are more likely to prefer social occupations such as counseling, social work, and teaching to enterprising occupations, such as being a clerk, salesperson, or project director (Caruso, Mayer, & Salovey, 2002). Higher EI scorers showed more adaptive defense mechanisms, such as sublimation, in preference to less adaptive mechanisms such as denial (Pelletteri, 2002). Finally, responding on the MSCEIT is unrelated to social desirability,  $r = .11$  (Lopes et al., 2003).

### What Is Known About the Predictive Validity of EI?

Many of the popularizations of EI—or EQ, as some put it—view it as “more powerful than IQ,” mattering “twice as much as IQ,” or, simply, as the “best predictor of success in life” (Gibbs, 1995, cover; Goleman, 1995, p. 34; 1998, p. 31). Such claims suggest that EI predicts major life outcomes at levels virtually unheard of in psychological science. Such claims do a disservice to the field, and we have argued against them repeatedly (Mayer, 1999; Mayer & Cobb, 2000; Mayer et al., 2000b). Needless to say, neither claims nor criticisms are enough by themselves. Careful demonstrations are necessary of

what EI actually does predicts (e.g., Matthews et al., 2001).

**Academic performance.** Several studies have now been carried out on the prediction from EI to school grades and intellectual problem solving. EI correlates with grades about  $r = .20$  to  $.25$  among college students (Ashkanasy & Dasborough, 2003; Barchard, 2003; Brackett & Mayer, 2003; Lam & Kirby, 2002). Academically gifted students in Israel scored higher on the test than their less gifted peers, particularly in strategic EI (Understanding and Management; Zeidner & Shani-Zinovich, 2003). The *incremental* prediction of EI and general intelligence, however, has been modest to slight, with most correlations dropping to a nonsignificant range once general intelligence is partialled out of the relation (Barchard, 2001; Brackett & Mayer 2003; Lam & Kirby, 2002; Zeidner & Shani-Zinovich, 2003).

In one study, in which academic performance explicitly involved emotion-related tasks, a stronger relation was found. Boone and DiGiuseppe (2002) studied 90 graduate students training in school and clinical psychology programs. These students scored above average in EI compared to the standardization sample. After controlling for demographic and academic variables, higher area scores in Experiencing Emotion remained positively related to both GPA and year in the program.

**Predictions to deviant behavior.** A consistent and unique pattern of prediction emerges when one examines the association between EI to deviancy and problem behavior. EI varies inversely with bullying, violence, tobacco use, and drug problems (Rubin, 1999; Trinidad & Johnson, 2002). These relations remain even when *both* intelligence and personality variables are statistically controlled for.

Rubin (1999) employed the Behavioral Assessment Scale for Children (Reynolds & Kamphaus, 1992), a behavioral rating scale that can be used to identify physical and verbal aggression among children in the school-yard and classroom. She asked about 50 students and their teachers to fill out the Behavioral Assessment Scale for Children for those they knew. She then correlated scores of the adolescent MEIS with student reports and found a correlation of  $r = -.45$  between, for example, student-rated aggression and EI scores.

A second line of research employs life-report data: personal reports of external life surroundings and events that an individual can reasonably observe (e.g., “How many wine glasses do you own?” “What clubs did you belong to in high school?” “How many times did you speak to your mother last week?”). It is both conceptually and empirically distinct from self-report data as traditionally conceived (Funder, 2001; Mayer, in press).

A series of studies has constructed new criteria of the life space—the social situations and groups that are external to and surround the person. To index the life-space, participants describe literally more than a thousand individual elements of their external lives via life space test items, and these are then aggregated into dimensions describing an individual’s surrounding life (Mayer, Carlsmith, & Chabot, 1998).

The first such study with EI was an undergraduate senior honors thesis (Formica, 1998). In the study, several life space dimensions specifically related to EI were correlated with the MEIS, and strong relations were found, even when partialing measures of intelligence and empathy. Some of the dimensions employed to describe the life space in that study and later ones are shown in Table 7.

For example, Rational Control, measured by items such as “What is the most advanced course you have taken in Engineering?” and “How long have you been a lab technician?” correlated  $r = -.39$  with EI and  $r = -.26$  with EI after partialing out for both IQ and sex. In that study and a later one, Social Deviance, measured by the number of physical fights, the number of times an individual vandalized something over the past year, and similar questions correlated  $r = -.27$ , and  $-.20$  with EI, partialing out the effect of both SAT scores and the Big Five (Brackett, Mayer, & Warner, 2004).

Finally, Swift (2002) examined EI among 59 individuals in a court-mandated violence-prevention

program in New Haven, Connecticut. He found a negative relation between Perceiving Emotions and psychological aggression (insults and emotional torment). Unexpectedly, however, he found a rise in psychological aggression with higher Managing Emotion branch scores.

**Predictions to prosocial and other positive behaviors.** Lopes et al. (2003) found that higher Managing Emotion scores in particular were positively related to the quality of interactions with friends (Study 1). Study 2 examined approximately 4,500 social interactions recorded in the diaries of 100 German college students and related them to a German-translated version of the MSCEIT. Students with higher Managing Emotion scores were more liked and more valued by the opposite sex. Relations for both studies remained significant even after partialing out the influence of the Big Five personality traits.

Similar findings were obtained across two additional studies of student groups at two different universities. Study 1 involved 66 participants divided into 24 groups and studied over a semester. Study 2 involved 76 members of a residential college who were well known to each other and for whom sociometric data were collected. Emotional Regulation (Branch 4) of the MSCEIT again predicted key aspects of rated social sensitivity and quality of interactions, with  $r$ s in the .30 to .40 range. These results maintained their statistical significance after other personality variables were partialled out (Coté, Lopes, Salovey, & Beers, in press).

Gohm, Corser, and Dalsky (2004) found that EI was positively related to stress management among college students who either closely attended to their emotion or regularly distanced from and intellectualized their feelings. EI showed no such advantage, however, among students who experienced little emotion or were overwhelmed by it.

**Findings related to leadership and organizational behavior.** Findings with the MSCEIT across organizations suggest some of the complexity that may exist when examining EI in social organizations. In career tracks in which EI skills may not be either central or necessary EI may decline going up the corporate ladder. That was the case with 59 senior executives tested in a large international production and service organization (Collins, 2001).

On the other hand, those lower in an organization apparently appreciate EI in their supervisors. Studying two small groups of managers (13 each from a public and private organization) along with 108 of their subordinates, Giles (2001) found a positive relation between aspects of subordinates’ commitment to their

Table 7. Emotional Intelligence and Life-Report Data<sup>c</sup>

Life-Report Measure With Sample Items <sup>b</sup>	Correlation With EI	Partial Correlation With EI
<i>Formica, 1998<sup>a</sup>; N = 208; Partial Correlation Controlling for Verbal SAT and Sex</i>		
Rational Control	-.39**	-.26**
What is the most advance course level you have taken in engineering?		
How long have you been a lab technician?		
Life Enthusiasm	.22**	ns
How long have you kept a journal of your feelings, hopes, and dreams?		
(-) When was the last time you shot a bb or pellet gun?		
Relatedness	.30**	.19**
How many movie dramas have you seen in the last year?		
How many pictures of friends/family members do you keep out in the open in your room?		
Solitary Culture	-.05	ns
How skilled are you in martial arts?		
Describe your experience writing poetry, fiction, and literature.		
Destructive Behavior	-.33**	.17*
When was the last time you insulted someone in public?		
When was the last time you shot a BB or pellet gun?		
<i>Brackett &amp; Mayer, 2003<sup>b</sup>; N = 188–202; Partial Correlation Controlling for Verbal SAT and the Big Five Personality Traits</i>		
Drug Use	-.05	-.07
Amount of marijuana owned?		
Times used illegal drugs in the last month?		
Alcohol Use	-.06	-.01
Bottles of beer owned?		
Times in the last month fell asleep while intoxicated?		
Cigarette Smoking		
Packs of cigarettes owned at this time?	-.02	.02
Number of cigarettes smoked per day?		
Social Deviance		
Number of physical fights in the last year?	-.27***	-.20**
Number of times vandalized something?		
<i>Bracket, Mayer, &amp; Warner, 2004<sup>b</sup>; N = 209–242</i>		
Illegal Drug User (Men):	-.32*	—
Times smoked marijuana in last month?		
Money spent on drugs in last month ?		
Deviant Behavior (Men):	-.45*	—
Number of physical fights in last year?		
Times vandalized something last year?		
<i>Trinidad &amp; Johnson, 2002<sup>d</sup>; N = 232; Controlling for the Big Five</i>		
Overall Tobacco and Alcohol Use	-.19*	-.20*
Ever smoked cigarette?		
Do you smoke once a day?		
Ever tried an alcoholic beverage?		
Have you drunk alcohol in the last 7 days?		

Notes. EI = emotional intelligence; ns = not significant.

<sup>a</sup>Used the Mayer–Salovey–Caruso Emotional Intelligence Test. <sup>b</sup>Used the Mayer–Salovey–Caruso Emotional Intelligence Test. <sup>c</sup>For example, Act Frequency, Life Space, General Behavioral Surveys. For all items the response format required specific answers (e.g., specific courses, numbers of objects or events, time intervals, or frequencies) and was multiple choice.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .005$ .

organization and supervisors' EI. (These were for the Emotion Management scale in one organization; Emotional Understanding, in the other).

Similarly, customer relations may be favorably influenced by EI. The average EI of 26 teams of claims adjusters (11 leaders, 26 teams; 164 individuals) predicted customer satisfaction with claims adjustments,  $r = .46$ , made across those 26 teams; the EI of the 11

team leaders, however, was inversely related to performance,  $r = -.51$ .

Perhaps EI is more important among workers who have the most direct contact with customers. That would also explain why higher total EI scores predicted,  $r = .22$ , better supervisor ratings of 78 employed undergraduates. This finding was based on questionnaires returned by supervisors in a mail

survey of employers of 176 working students. The correlation remained significant when cognitive intelligence was partialled out in a regression analysis (Janovics & Christiansen, 2002).

Part of interpersonal relationships involves motivating others. Higher EI individuals appear to write higher quality vision statements than others. These vision statements were generated by 137 women and men who worked in 40 groups on a simulated consultancy project. The result remained significant even after controlling for the Big Five personality traits (Coté, Lopes, & Salovey, 2003).

One way to interpret such findings is to suggest that EI positively contributes to job performance when the maintenance of positive personal commitments is important to success.

**Development of EI and learning of emotional knowledge.** We have speculated that EI is a relatively stable aptitude, whereas emotional knowledge—the kind of information that emotional intelligence operates on—is relatively easy to acquire and teach. Some research has begun on the developmental course and implications of EI.

Two theses we located reported attempts to teach emotional knowledge to counselors and students so as to raise their EI or change their behavior. One study employed the MSCEIT and the other employed an adolescent adaptation of the MSCEIT. Both used short-term training programs, and there was little or no influence of training in emotional knowledge on desired outcomes in the studies (Forrey, 2000; Stephenson, 2003). We believe that further research remains warranted in this area.

Marsland and Likavec (2003) noted that mother-child interactions often predict preschooler's social competence. They measured mother's EI when their children were 3½ years of age. Maternal Total EI scores, and especially Perceiving scores, were highly related to child empathy, prosocial peer relations, and relatedness in this sample of 67 predominantly White infants and their mothers. The mothers' EI scores were also significantly related to quality of attachment, measured objectively 2½ years earlier when the infants were 1 year of age. In other words, maternal EI measured as an ability and secure attachment measured objectively are interrelated and both predict social competence. On a related note, Dyck, Ferguson, and Schohet (2001), employing their own ability tasks of emotional recognition, found that child EI distinguished autistic children, but not those with Asperger's Syndrome, from those with mental retardation, ADHD, and anxiety disorders.

One of our own studies examined developmental trends in EI between adolescent and college-age students. The college students scored somewhat higher than the adolescent youth (Mayer et al., 1999). The

most striking trend was for Understanding, and the least strong was that for Perceiving, which is interesting considering that Understanding is most related to cognitive intelligence. In a cross-sectional design sampling roughly 400 college students (about 100 each year), however, Gohm and Clore (2002) found no increase in MSCEIT scores across the college years, though this was a limited age range.

## Discussion

### The Present Status of EI Measurement

EI is an intelligence that operates on, and with, emotional information. Emotional information concerns the meaning of emotions, emotional patterns and sequences, the appraisals of relationships they reflect. We have previously suggested that EI must meet three criteria to be considered a standard intelligence: (a) it must be operationalized as a mental ability, (b) it must meet correlational criterion that indicate it is a unitary ability that represents a new kind of performance relative to earlier measures of intelligence and other personality dispositions, and (c) it must exhibit growth with age—a developmental course similar to that of other intelligences (Mayer et al., 1999). An equivalently important concern, at this point, is that EI predict outcomes of importance.

We have presented evidence about EI, involving studies from many different laboratories and employing literally thousands of participants who have had their EI levels assessed by two ability measures of EI, the MSCEIT, and its precursor, the MEIS. In relation to operationalizing EI, EI test items can be developed that possess both correct answers and ecological validity. In relation to the correlational patterns of EI measures, scales have been developed that are highly reliable, measure a set of abilities that form a unitary factor (which can be divided into two or four subfactors), and measure something distinct relative to earlier intelligences, and distinct from a wide range of personality scales examined thus far. The limited evidence presented thus far suggests that EI increases with age. The existence of brain areas implicated in integrating emotional and cognitive areas (Damasio, 1994; TenHouten et al., 1985), and the evolution of emotion as an evolved symbol system (Ekman, 2003), suggest that EI not only meets our own criteria for an intelligence, but may also meet brain-based criteria suggested by others (Gardner, 1983).

More generally, accumulating evidence indicates that EI, measured as an ability, predicts a variety of important outcomes. As EI rises, so does academic performance, measures of relatedness, the ability to communicate motivating messages such as vision statements, and other similar criteria. As EI declines,

problem behaviors, deviance, and drug use rise. Together with qualitative studies of high EI individuals (Mayers, Perkins, Caruso, & Salovey, 2001; Vitello-Cicciu, 2001), this information helps us to characterize the individual high in EI.

### What Is the High EI Individual Like?

**A composite picture.** The high EI individual, most centrally, can better perceive emotions, use them in thought, understand their meanings, and manage emotions better than others. Solving emotional problems likely requires less cognitive effort for this individual. The person also tends to be somewhat higher in verbal, social, and other intelligences, particularly if the individual scored higher in the understanding emotions portion of EI. The individual tends to be more open and agreeable than others. The high EI person is drawn to occupations involving social interactions such as teaching and counseling more so than to occupations involving clerical or administrative tasks.

The high EI individual, relative to others, is less apt to engage in problem behaviors and avoids self-destructive, negative behaviors such as smoking, excessive drinking, drug abuse, or violent episodes with others. The high EI person is more likely to have possessions of sentimental attachment around the home and to have more positive social interactions, particularly if the individual scored highly on emotional management. Such individuals may also be more adept at describing motivational goals, aims, and missions.

**A case example.** Vitello-Cicciu (2001) administered the MSCEIT to 50 nurse managers at a large metropolitan medical center. She then interviewed 14 managers in depth who scored more than one standard deviation above or below the mean score of 100. Because nurse managers are, in general, high scorers on the MSCEIT, 11 of these individuals were high scorers. Some excerpts from a nurse-manager (case 9), whose overall EIQ = 119, indicates some of the style of a high EI individual (Vitello-Cicciu, 2001, p. 80). Manager Nine, like the other high scorers, perceives her emotions and uses them as signals in self-understanding and management:

If I start to get very emotional, if they start to intensify a little bit, it probably means that I'm tired. If I can't handle emotions very well, or if I start to get angry again and again, it usually means that maybe I've been working a little too much and maybe the stress level is a little high and I have to do something else for a while .... (Vitello-Cicciu, 2001, p. 104)

Such above average EI scorers show understanding of what to do in their workplaces to help keep people

working as a team. To do this, they have clear understandings of what they can and cannot do:

I've got to do something to break it [the stress level in the workplace] because that's the one thing I control. I can't control their [the nurses] lives, I can't control their husbands or their sickness or what's going on in their families but ask what can I do in this unit to drop the stress level .... (Vitello-Cicciu, 2001, p. 104)

The desire to manage other peoples' feelings comes out of a recognition and respect for how others feel:

I've seen other people talk down to people depending on their spot on the food chain and I think that's wrong. I think that's not being sensitive to their needs and it doesn't work to create a team atmosphere .... I think you have to show a lot of respect to everybody that you work with. (Vitello-Cicciu, 2001, p. 87)

Reading through this and other cases, one also senses the openness and agreeableness that characterize such individuals, how their emotional management of themselves and others—based as it is on a monitoring of emotional levels in general—will keep cooperation high, and why such an individual would, in general, value their family members and other friends.

### Understanding Criticism in the Area

The critical comments about EI that we sometimes have quoted throughout this article may raise the question of how to integrate the negative views of the field with the information in this article. What sense can be made of comments such as that "purported measures of emotional intelligence are unreliable, invalid, or both" (Becker, 2003, p. 194), and that "A major weakness with the extant EI literature is the lack of scientifically sound, objective measures of the EI construct" (Pfeiffer, 2001, p. 140)?

There are some rules of thumb that are helpful for making sense of criticism of the EI area.

First, a great deal of criticism is aimed at the naïve popularizations of the concept, and particularly the irresponsible claims in the popular press. Those criticisms do not apply here. This theory is deeply rooted in the psychological literature, and we argued against the popular claims publicly and repeatedly as soon as we assured ourselves that the claims were indeed unsupported (Mayer, 1999; Mayer & Cobb, 2000; Mayer et al., 2000b).

Second, a great deal of criticism in the EI area pertains to self-report scales as opposed to EI measured as an ability. Certain of those self-report approaches are appropriate as measures of self-perceived EI, but do not measure actual EI ability. Other self-report scales are

measures that may be better viewed as traditional personality assessments, rather than as self-estimates of one's own EI. Again, this is a point we agree with and have made repeatedly (e.g., Brackett & Mayer, 2003).

Third, research in the field of EI is dynamically expanding. Examining the specific statements of some critics and comparing them to the work they cite suggests that they often are unaware of recent articles or have not fully integrated new work in their comments (e.g., Becker, 2003, p. 194; Pfeiffer, 2001, p. 140). In part, of course, this may be an unavoidable product of publication lags that occur in scientific journals and books.

Fourth, there are a near-infinite list of potential studies that would be useful to conduct, higher standards for one or another specific features of the tests we employ, and areas of possible improvement. There also exist legitimate criticisms that can be leveled at our ability model and at the MSCEIT, as well as the tests we designed that led up to it. These criticisms should serve, and have served, to move the field forward.

Given that there exist legitimate criticisms of our work and also a near-infinite list of desirable but possibly unattainable criteria for just about any measurement procedure, a means is necessary for balancing the two. Consequently, our fifth guideline for understanding criticism in the area is to place legitimate criticisms of our own and others' work into context by asking "How much does this matter?" and "How high a priority is it?"

In regard to our own priorities, these were to explore the possible existence of an EI and, if it existed, discover something about what it may predict. In 1990, we described our belief that there may exist a new intelligence, called "emotional intelligence." We also provided preliminary empirical data in support of the possibility (Mayer et al., 1990; Salovey & Mayer, 1990). Researchers who do this are expected to find out if such an intelligence actually exists, for example, by constructing individual tasks that can tap the intelligence and by exploring the existence of the hypothesized intelligence through various research studies. The series of studies we have reported here establish a reasonably secure foothold for EI in the intelligence literature.

Having accomplished these theoretical steps, researchers are generally expected to provide evidence as to whether their claim has any practical significance. To determine whether EI is of importance, it was necessary to develop a measurement instrument that was sufficiently easy to use, reliable, and valid, so that we and other interested researchers could try to understand what EI may be related to and predict. The MSCEIT is, indeed, a convenient-to-administer test that is highly reliable at the total-score, area, and branch levels, and provides a reasonably valid measure of EI in the many psychometric senses of the word *valid*.

These have been our priorities since 1990, and the research we have reported here attempts to address

those priorities. Would it also be nice for the MSCEIT to possess a more unique or somewhat different factor structure? Is it critical to conduct further studies into the exact emotional and cognitive processes underlying the skills assessed by the test? Is it important to have higher reliabilities at the level of the individual tasks? Is there "slippage" of the exact content validity? Perhaps. And are there a thousand further improvements that could be made to the test? Yes, absolutely, as there are for any such test.

In traditional intelligence research, different measures of an intelligence—say, verbal intelligence—tend to correlate highly with one another despite small variations in how they are constructed. Our perspective on a century of research in intelligence testing suggests that the greatest understanding of verbal intelligence has come from such matters as its convergent, discriminant, and predictive validity, and, perhaps, from its underlying neuropsychological underpinnings. More technical concerns, including the specific factor structure of its subscales, the exact content of its tasks, and the reliability of the smaller divisions of tests that measure it, are without question important. Their importance, however, may lie more in how they inform advances in procedures and methods generally in the intelligence field, as much as what they specifically illustrate about verbal intelligence itself. Our perspective has led us to focus in these early days of EI research on the broader issues of EI: What it is and what it predicts. Studies thus far support the idea that the MSCEIT is at least an adequate test to address key issues about EI in these ways.

The priorities for research in the area as we now see them concern (a) learning more about what EI predicts, (b) understanding how EI relates to other intelligences and other personality traits, (c) understanding the processes underlying EI, (d) determining whether teaching emotional knowledge has a desirable effect on behavioral outcomes and might change EI itself, and (e) expanding EI measurement to a wider range of age groups to better understand its developmental course.

#### Note

John D. Mayer, Department of Psychology, University of New Hampshire, Durham, NH 03824. E-mail: jack.mayer@unh.edu

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