



Selecting a Measure of Emotional Intelligence

The Case for Ability Scales

John D. Mayer, David R. Caruso, and Peter Salovey

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The development of theoretical models of emotional intelligence has been paralleled by the development of tests to measure the concept. Since 1990, when the first scale measuring an aspect of emotional intelligence was reported in a scientific journal (Mayer, DiPaolo, & Salovey, 1990), there has been an explosion of measures of emotional intelligence. These include a number of nonscientific self-report scales that appeared in newspapers, magazines, and World Wide Web sites (for example, *USA Today*, the *Utne Reader*), and also a wide variety of serious endeavors (Bar-On, 1997; Boyatzis, Goleman, & Hay/McBer, 1999; Cooper, 1996/1997; Mayer & Geher, 1996; Mayer, Salovey, & Caruso, 1997, 1999a).

With so many tests available, it would be helpful to have an overview of the existing scales of measurement, and we provide that at the beginning of this chapter. Here, we examine the content coverage of available scales and these tests' methods of measurement. Our own focus is on ability measures of emotional intelligence because we view these instruments as most promising. In the latter parts of this chapter we examine our current scales for assessing emotional intelligence, and finally, the correlates of emotional intelligence, defined as an intelligence.

GENERAL MEASUREMENT ISSUES IN SELECTING A SCALE

What Do Emotional Intelligence Tests Measure? The Problem of Content Validity

The first consideration in evaluating a measure of emotional intelligence is the aspect of mental life it measures. The match between what a test says it measures and the content of its items is known as content validity. The content of emotional intelligence tests varies greatly due to the fact that interpretations of the meaning of the term *emotional intelligence* vary widely (see our Chapter Five). Table 15.1 provides a comparison of such scales, which are arranged into three groups: ability, self-report, and observer-rating measures. These distinctions are discussed further below. For now, however, we focus on the content of each scale.

The ability scale represented is the Multifactor Emotional Intelligence Scale (MEIS). This scale measures emotional intelligence according to the theory that emotional intelligence is an intelligence per se, in that it relates to processing information (Mayer & Salovey, 1997; Salovey, Bedell, Detweiler, & Mayer, 2000). It is divided into four components. The first, *emotional perception*, involves such abilities as identifying emotions in faces, music, and stories. The second, *emotional facilitation of thought*, involves abilities such as relating emotions to other mental sensations such as taste and color (relations that might be employed in artwork), and using emotion in reasoning and problem solving. The third area, *emotional understanding*, involves solving emotional problems such as knowing which emotions are similar, or opposites, and what relations they convey. The fourth area, *emotional management*, involves understanding the implications of social acts on emotions and the regulation of emotion in the self and others.

Next, we move to two self-report scales. The BarOn EQ-i is intended to measure "an array of noncognitive capabilities, competencies, and skills that influence one's ability to succeed in coping with environmental demands and pressures" (Bar-On, 1997, p. 14). The EQ-i is divided into five sections. The first, *intrapersonal*, includes measures of self-awareness, the ability to assert oneself, and the ability to view oneself positively. The second, *interpersonal*, includes such skills as empathy and social responsibility. The third, *stress management*, includes skills such as problem solving and reality testing. The fourth, *adaptability*, includes stress tolerance and impulse control. Finally, *general mood* includes happiness and optimism. (See Chapter Seventeen for an updated view of the EQ-i that indicates general mood to be a facilitator of emotional intelligence, rather than a part of it.)

A second self-report scale, the EQ-Map (Cooper, 1996/1997), also divides emotional intelligence into five attributes. The first, *current environment*, measures life pressures and life satisfactions. The second, *emotional literacy*, includes measures of emotional self-awareness, emotional expression, and emotional

Table 15.1. Emotional Intelligence and Personality Tests, Using Ability, Self-Report, and Informant Approaches to Measurement.

Ability	Self-Report		Informant
<i>Multifactor Emotional Intelligence Scale (MEIS)</i> (Mayer, Salovey, & Caruso, 1997/1999)	<i>BarOn EQ-i</i> (Bar-On, 1997)	<i>EQ-Map</i> (Cooper, 1996/1997)	<i>Emotional Competence Inventory (ECI)</i> (Boyatzis, Goleman, & Hay/McBer, 1999)
<i>Emotional Perception</i> Identifying emotions in faces, emotions in designs, emotions in music, emotions in stories	<i>Intrapersonal</i> Emotional self-awareness, assertiveness, self-regard, self-actualization, independence	<i>Current Environment</i> Life pressures, life satisfactions <i>Emotional Literacy</i> Emotional self-awareness, emotional expression, emotional awareness of others	<i>Self-Awareness</i> Emotional self-awareness, accurate self-assessment, self-confidence <i>Social Awareness</i> Empathy, organizational awareness, service orientation
<i>Emotional Facilitation</i> Translating feelings (Synesthesia), Using emotions to make judgments (Feeling Biases)	<i>Interpersonal</i> Empathy, interpersonal relationship, social responsibility <i>Stress Management</i> Problem solving, reality testing, flexibility	<i>EQ Competencies</i> Intentionality, creativity, resilience, interpersonal connections, constructive discontent	<i>Self-Management</i> Self-control, trustworthiness, conscientiousness, adaptability, achievement orientation, initiative
<i>Emotional Understanding</i> Defining emotions, complex emotional blends, emotional transitions, emotional perspectives	<i>Adaptability</i> Stress tolerance, impulse control <i>(General Mood)</i> Happiness, optimism	<i>EQ Values & Attitudes</i> Outlook, compassion, intuition, trust radius, personal power, integrated self	<i>Social Skills</i> Developing others, leadership, influence, communication, change catalyst, conflict management, building bonds, teamwork
<i>Emotional Management</i> Managing own emotions, managing other's emotions		<i>EQ Outcomes</i> General health, quality of life, relationship quotient, optimal performance	

awareness of others. The third, *EQ competencies*, includes intentionality, creativity, resilience, interpersonal connections, and constructive discontent. The fourth, *EQ values and attitudes*, includes outlook, compassion, intuition, trust radius, personal power, and integrated self. Finally, the *outcomes* area of the EQ-Map measures explicit outcomes of emotional intelligence: general health, quality of life, relationship quotient, and optimal performance.

Moving next to a joint self-report/observer rating scale, the Emotional Competence Inventory (ECI) defines emotional intelligence as the "capacity for recognizing our own feelings and those of others, for motivating ourselves, and for managing emotions well in ourselves and in our relationships" (Boyatzis et al., 1999, p. 1). The ECI measures four aspects of emotional intelligence. The first, *self-awareness*, includes measures of emotional self-awareness, accurate self-assessment, and self-confidence. The second, *self-management*, measures self-control, trustworthiness, conscientiousness, adaptability, achievement orientation, and initiative. The third, *social awareness*, consists of empathy, organizational awareness, and service orientation. The fourth, *social skills*, includes measures of developing others, leadership, influence, communication, change catalyst, conflict management, building bonds, and teamwork and collaboration. These competencies are measured by asking informants to rate the target person, as well as by having the target evaluate himself or herself via self-report.

Which test content best represents the concept of emotional intelligence? To help evaluate the content of emotional intelligence measures, one needs to define emotion and intelligence. Emotion is an organized response system that coordinates physiological, perceptual, experiential, cognitive, and other changes into coherent experiences of moods and feelings, such as happiness, anger, sadness, and surprise (Smith & Lazarus, 1990, p. 610). Emotions typically arise in response to changes in relationships. Intelligence has many different definitions, but the central ones always place a primary emphasis on abstract reasoning and may, secondarily, refer to adaptation. Terman (1921, p. 128) stated that "an individual is intelligent in proportion as he is able to carry on abstract thinking."

Elsewhere, we have argued that a great number of models under the rubric of "emotional intelligence" reflect personality more broadly (Mayer, Salovey, & Caruso, 2000). Personality involves all the major parts of the person's psychology—the mechanisms, processes, structures, and so forth—how those parts are organized, and how those parts develop (Mayer, 1998). For example, a widely used measure of personality is the California Personality Inventory (CPI) (Gough, 1994). That scale measures four broad aspects of personality. The first, *interpersonal style*, contains measures of dominance, capacity for status, sociability, social presence, self-acceptance, independence, and empathy. The second, *normative social behavior*, measures responsibility, socialization, self-control, good impression, communality, well-being, and tolerance. The third, *cognitive functioning-achievement*, includes the measurement of achievement via conformance, achievement via independence, and intellectual efficiency. The final *qualitative aspects of thinking* scales include psychological mindedness, flexibility, and femininity/masculinity. In comparison to a personality scale such as the CPI, it seems to us, a measure of emotional intelligence should be differentiated by its focus on the idea that one thinks intelligently with one's emotions and, conversely, that emotions enhance intelligence. This analysis indicates that some of

the scales of emotional intelligence reviewed earlier appear to have considerable overlap with standard measures of personality, such as the CPI.

This is not merely a semantic argument. It reflects fundamental issues of content validity—what a test measures—and incremental validity—what a test adds to our understanding beyond what we already know or can already measure, with existing tests. In fact, the overlap between self-report measures of emotional intelligence and personality inventories recently led a group of researchers to conclude that “as presently postulated, little remains of emotional intelligence that is unique and psychometrically sound. Thus, [self-report] questionnaire measures are too closely related to ‘established’ personality traits [to be considered anything new]” (Davies, Stankov, & Roberts, 1998, p. 1013).

Although we think the above quote represents an extreme position, the degree of overlap between self-report scales of emotional intelligence and already-existing personality scales is a matter of legitimate concern. Given the investment many people are placing in emotional intelligence, one would want to ensure there is something new about it.

Measurement Approaches

We now turn to the second dimension on which to evaluate emotional intelligence tests: the method by which the test gathers information. As shown in Table 15.1, these tests use self-report, informant, or performance approaches.

Self-Report. Self-report measures ask people to endorse a series of descriptive statements, indicating to what extent these describe or do not describe themselves. For example, one can ask questions of the sort, “Are you generally clear about your feelings or confused about them?” (Mayer & Gaschke, 1988; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). Self-reported abilities and traits rely on the individual’s self-understanding. If a person’s self-concept is accurate, then these sorts of measures can often serve as an accurate measure of the actual ability or trait. If the person’s self-concept is inaccurate, which is often the case (Taylor & Brown, 1988), then self-report measures yield information concerning only the person’s self-concept, rather than the actual ability or trait. People are notoriously inaccurate reporters in several areas of functioning, including the self-assessment of ability: self-reported intelligence correlates only modestly with actual measured intelligence—below .30 or so (Paulhus, Lysy, & Yik, 1998). Such associations indicate that people’s self-reports of their mental abilities are quite independent of their actual abilities. Although self-beliefs are important (Bandura, 1977, 1997), we are interested in measuring emotional intelligence itself. In contrast to self-report, ability measures tap facets of the person’s actual intelligence.

Informants. Informants are the second method used to measure a trait. The use of informants yields information about how a person is perceived by others and

employs questions such as "Indicate the level (very high, high, average, low, very low) the person has attained for each of the following: stays open to ideas; readily adapts to changes; is a good listener."

This alternative has obvious advantages over self-report measures—or does it? The informant approach essentially measures a person's reputation. That reputation is influenced by many things, such as how well the person treats those around him or her, and the informant's beliefs about how personality operates (Funder, 1995). The advantage of using informants is that one obtains a very good idea of a person's reputation—and reputations are important (for example, Hogan & Shelton, 1998). A person's reputation may even be more important than his or her actual abilities for some purposes (for example, running in an election), but reputation is also different from abilities. In addition, some aspects of a reputation are fairly visible and appear to be judged accurately. These include talkativeness, and sociability. More internal cognitive styles and capacities, however, are judged much less accurately (Funder & Dobroth, 1987). What an informant perceives, therefore, remains a step removed from actual abilities.

A related approach enlists observers who directly code specific behaviors (the observer rating approach). Although we are aware of no test of emotional intelligence that employs this method, it would be appropriate only for observable behaviors, not for mental abilities with no fixed behavioral consequences.

Ability or Performance Measures. The third method to measure a trait is to use a performance measure. With this method, to determine how smart a person is, that individual is asked to solve problems such as "How much is thirteen multiplied by three?"; "What does the word 'analyze' mean?"; or, "What city is the capital of France?" Ability testing is the gold standard in intelligence research because intelligence corresponds to the actual capacity to perform well at mental tasks, not just one's beliefs about those capacities (Carroll, 1993; Mayer & Salovey, 1993; Neisser et al., 1996; Scarr, 1989). If one wants to understand how well people perceive emotion, one can show them a sad face, for example, and see if they recognize the facial expression. Or, if one wants to understand how well they reason about emotions, one can provide an emotional problem and assess the quality of their reasoning in response.

THE ABILITY APPROACH TO ASSESSING EMOTIONAL INTELLIGENCE

This brief review indicates that the available tests of emotional intelligence vary widely both in their content and method of assessment. Different tests are valid for different purposes. We have pursued an ability approach to the assessment

of emotional intelligence, in part because of our commitment to an intelligence model of emotional intelligence, and in part because of the advantages inherent in this approach. For further reviews of self-report scales we recommend additional chapters in this handbook (see also Salovey, Woolery, & Mayer, forthcoming). In the remainder of this chapter we focus on ability measures of emotional intelligence and their predictions.

Measurement Issues Specific to Ability Testing

Many issues related to ability testing of emotional intelligence have been dealt with in thoughtful ways in research literatures closely related to emotional intelligence. Interested readers may wish to examine reviews of nonverbal communication (Buck, 1984), empathic accuracy (Ickes, 1997), emotional perception (Lane et al., 1996), social intelligence (Legree, 1995; Sternberg & Smith, 1985; Thorndike & Stein, 1937; Wong, Day, Maxwell, & Meara, 1995), and several other intelligences related to emotional intelligence (see Mayer, Salovey, & Caruso, 2000, for a more complete review).

The Problem of the Correct Answer. The first issue concerning the measurement of emotional intelligence as an intelligence is determining the correct answer to a given problem. Say we want to know how much happy emotion is suggested by an abstract painting. What should we accept as the right answer? People often say there is no right way to feel, and they would extend this philosophy to the present situation by remarking, "Whatever you think, is right," meaning that whatever response a person has to a piece of art is a true response, or at the very least is a personal affair. We are sympathetic to such points of view; they recognize the legitimate differences in perception from one person to the next and represent a practical reality in many areas of life. At the same time, we believe there are limits to legitimate interpretations—that is, illegitimate interpretation is possible as well.

We argue that there is some basis for claiming "right answers" on emotional intelligence test items because there are both evolutionary and cultural foundations for the consistency of emotionally signaled information. Biologically speaking, there is an emotional body language across species, such that we freely recognize emotional states such as contentedness in the cat or anger in the dog. The evolution of emotion was discussed at considerable length by Darwin (1872/1965), who argued for a consistent emotional "language" across many species, and universal facial expressions of emotion among humans—a position strongly supported one hundred years later (Ekman, 1973).

Culturally speaking, cultural memes—ideas that replicate themselves across books, recordings, articles, and the Word Wide Web—can be thought of as analogous to biological genes. Emotional ideas are disseminated and reproduced as popular ideas according to the degree to which people within a culture find

them useful. This cultural transmission further perpetuates the joint biological and cultural evolution of emotional understanding (Ball, 1984).

If we wish to impose a criterion of correctness for emotional intelligence test items—which we must, if we are to use an ability approach—we have at least three alternatives for designating a correct answer: target criteria, expert criteria, or consensus criteria. The target criteria can be illustrated with the following example. Say we take a poll around the office and ask a variety of people how their coworker, Todd, is feeling. Some people say he is fine, others say he is sad, and still others, say he is angry. If we match people's guesses against what Todd tells us he is honestly feeling (such as "a little sad"), that would be a target criterion; that is, those who guessed "sad" met the criterion of correctness. In our actual research, we have asked people to write down what they are doing and thinking and, also, how they are feeling. That written description then becomes an item on an ability task. The test taker guesses how the target was feeling at the time by referring to multiple emotion rating scales.

Expert criteria, by contrast, are established in the same case by asking experts in emotions (such as clinical psychologists, emotions researchers) to read the target's story and, using their best judgment, to determine how the target was feeling at the time. The test taker receives credit if his or her ratings correspond to those of the experts. Consensus, the third method, pools the judgments of hundreds of people. The test taker receives credit for endorsing emotions that the group endorses.

The correlations among the above three criteria are generally positive. For instance, the correlations between target and consensus scores over twelve emotional intelligence ability tests ranged from a low positive correlation of .22 to a very high positive correlation of .81 (Mayer, Caruso, & Salovey, 1999). These findings indicate that target and consensus scoring are often rather similar. One important aspect of these three scoring methods is that the similarity among scoring methods enables us to view some answers as more plausible than others. In our own research, we find that the consensus criterion is the best single means of determining a correct answer for two reasons. First, targets appear to minimize their own negative feelings when asked about them (Mayer & Geher, 1996). Second, large numbers of people, when their observations are pooled, seem to become reliable forecasters (Legree, 1995; Mayer & Geher, 1996; Mayer, Caruso, & Salovey, 1999). In addition, if one subscribes to the idea that emotional signals evolve, either biologically or culturally, then a wide, representative, sample of observers is probably a good judge of correctness under at least some circumstances.

How Do You Measure Whether People Can Recognize Their Own Feelings?

Up to now, we have been discussing one person's accuracy in judging another person's emotions. Is there any way to determine how accurately a person

judges his or her *own* feelings? One can certainly ask the person directly, but such self-report measures are often highly correlated with present mood: happy people say they understand their feelings, and unhappy people report being confused about them (Mayer & Gaschke, 1988). Fortunately, there are other approaches. For example, one can assess physiological signs of emotions (localized brain activity, increased heart rate, systolic blood pressure, skin conductance, and so forth) and compare them to a person's self-report (Davidson & Irwin, 1998; Gross, 1998). Such procedures require a great deal of equipment, not to mention expertise. Fortunately, it may not be necessary to assess people psychophysiologically to discover how good they are at reading their own moods. In carefully controlled laboratory settings, Zuckerman, Rosenthal, and colleagues have found that the perception of emotion within oneself is significantly correlated to the ability to assess it in others (Zuckerman, Lipets, Koivumaki, & Rosenthal, 1975; Zuckerman, Hall, DeFrank, & Rosenthal, 1976). For that reason, tasks typically included in ability scales of emotional intelligence that measure a person's ability to perceive emotion—in the faces of people around them, their responses to artwork, and so forth—can be expected to indicate introspective capacity as well.

The Problem of Reliability. One further concern raised about ability measures of emotional intelligence is whether they are sufficiently reliable (that is, measure an ability consistently). For example, Davies et al., (1998) found that early "objective measures of emotional intelligence suffer from poor reliability" (p. 1013). Scales of nonverbal perception (which include some measures of emotional perception) suffered from problems of low reliability (Buck, 1984; Mayer et al., 1990). Indeed, early tasks designed to measure emotional intelligence possessed only modest test reliability, in the $r = .50$ range. Although we viewed these reliabilities as acceptable for experimental research in the early 1990s, our newer ability scales have demonstrated higher internal consistencies. The next section describes the development of such scales and what they measure.

OUR APPROACH TO EMOTIONAL INTELLIGENCE

Mayer and Salovey's ability model of emotional intelligence was based on a line of theoretical work aimed at taking a general notion of an emotional intelligence and rendering it so that it could be operationalized (Mayer & Salovey, 1993, 1995, 1997; Salovey & Mayer, 1990). According to that framework, emotional intelligence involves the capacity to reason with and about emotions, including "[1] the ability to perceive accurately, appraise, and express emotions; [2] the ability to access and/or generate feelings when they facilitate thought; [3] the ability to understand emotion and emotional knowledge; and [4] the ability to

regulate emotions to promote emotional and intellectual growth” (Mayer & Salovey, 1997, p. 10, *numbering added here*).

The ability scales discussed below measure each of these four areas of abilities: perception, facilitation, understanding, and management.

MULTIPLE-TASK MEASURES OF EMOTIONAL INTELLIGENCE

Advent of Multiple-Task Ability Measures

The early 1990s saw the development and study of initial measures of aspects of emotional intelligence, for example, individual measures of emotional perception, or emotional understanding (Mayer et al., 1990; Mayer & Geher, 1996; for a review, see Mayer, Salovey, & Caruso, 2000). The more comprehensive study of emotional intelligence, however, awaited the examination of multiple tasks together. This was necessary because an intelligence is classically defined as a group of mental abilities that rise and fall more or less together. In the case of emotional intelligence, we began construction of a series of multitask ability tests in the middle 1990s, developing first the Multifactor Emotional Intelligence Scale (MEIS), a twelve-subscale ability test, and then the Mayer, Salovey, and Caruso Emotional Intelligence Test (MSCEIT) (Mayer et al., 1999a). We focus here on the MSCEIT, the newer of our scales (see Mayer, Caruso, & Salovey, 1999, for a description of the MEIS).

Mayer, Salovey, Caruso Emotional Intelligence Test

The MSCEIT is an ability measure of emotional intelligence designed to yield an overall emotional intelligence score, as well as subscale scores for perception, facilitation, understanding, and management. Each branch includes several subtests, some of which are described below.

Branch 1: Perception of Emotion. The MSCEIT contains three subtests measuring the perception of emotion: in faces, in landscapes, and in abstract designs. A sample design of the sort employed in the MSCEIT is shown in Figure 15.1. In this subscale, the person views the design (or face, or landscape) and must then report the amount of emotional content in it, judging, for example, how much happiness, how much sadness, how much fear, and so on. For each emotion, the participant responds using a five-point scale. For example, in the design shown in Figure 15.1, the swirling yellow, blue, and other colors may suggest happiness, so the participant might be expected to indicate that happiness is present. Moreover, the soft colors and shapes also suggest an absence of anger, so the participant might be expected to indicate that anger is mostly absent.

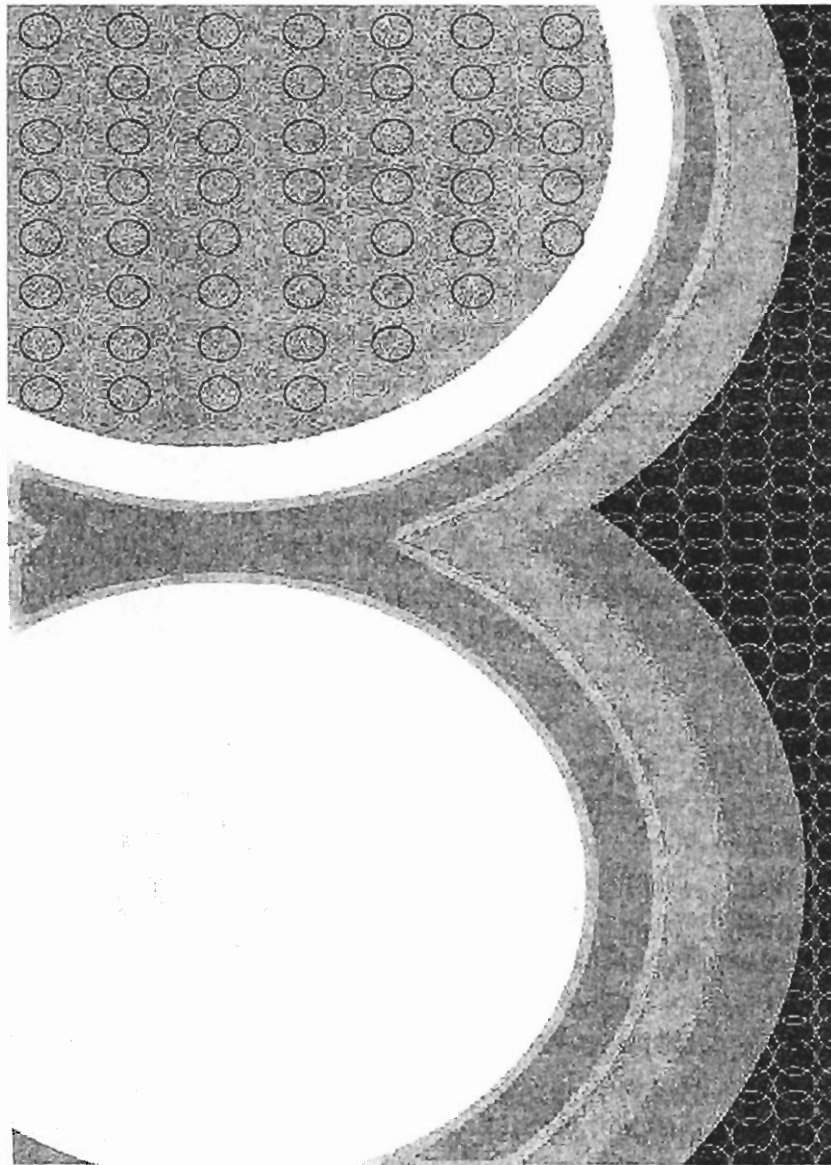


Figure 15.1. Sample design and landscape from the MSCEIT.

The branch 1 tasks on the MSCEIT are designed to be as uncontaminated with verbal content as possible. For that reason, the response alternatives for a given item on the landscape and designs tasks are anchored by faces expressing varying degrees of each emotion (verbal labels are used as well to clarify any ambiguity in the drawings). The faces task uses a numerical scale, however, so there is no interference between the faces being judged and the faces that make up the response scales.

Branch 2: Emotional Facilitation. The MSCEIT contains several subscales assessing whether people use emotion to facilitate cognitive activities. Most central to this measurement is the synesthesia subscale. The synesthesia task asks participants to judge the similarity between an emotional feeling, such as love, and other internal experiences, such as temperatures and tastes. The idea is that such internal comparisons indicate that emotions are not only sensed and perceived, but also processed in some meaningful, initial way. A participant might be asked to “imagine feeling *love* toward a friend, who has been very kind and supportive of you. How much is that love like each of the following sensations?”

	Not Alike				Very Much Alike	
Hot	1	2	3	4	5	
Slow	1	2	3	4	5	

Other branch 2 tasks on the MSCEIT examine facilitation in other ways.

Branch 3: Understanding Emotion. The third group of MSCEIT tasks examines the understanding of emotion. These tasks include blends, wherein a person tries to match a set of emotions, such as joy and acceptance, to another, single, emotion that is closest to it. Responses are in a multiple choice format. One item might ask which alternative combines “joy and acceptance: (a) guilt, (b) challenge, (c) mania, (d) love, or (e) desire.” Also included is a transitions task, in which the test taker is asked what happens as an emotion intensifies or changes. For example, a problem might ask, “Jamie felt happier and happier, joyful, and excited; if this feeling intensified it would be closest to (a) challenge, (b) admiration, (c) pride, (d) peacefulness, (e) ecstasy.” A similar, progressions, task asks participants to identify a change of relationship that might bring about a specific mood change. For example, participants might choose an alternative such as “a piece of music he liked came on the radio” to explain why a person’s happiness might rise slightly. Other tasks measure this branch as well.

Branch 4: Managing Emotion. The managing emotion tasks concern the best way to regulate emotions in oneself and other people. Each item of the managing emotion cluster of items describes a person with a goal of changing or maintaining a feeling, such as staying happy, or feeling better. The test taker must choose a given alternative that describes a course of action that might satisfy the goal. For example, if a sad person wanted to cheer up, the alternatives might involve “talking to some friends,” “seeing a violent movie,” “eating a big meal,” or “taking a walk alone.” Some alternatives are more likely to lead to cheering the person up than others, and those are scored more highly according to a consensus criterion. The managing emotion in situations subscale is similar, except

that more complex social situations are described and the actions more often involve interpersonal interactions.

GENERAL PROPERTIES OF ABILITY MEASURES OF EMOTIONAL INTELLIGENCE

Results from the MSCEIT and its precursor, the MEIS, are providing increasing information about the measurement of emotional intelligence as an ability and what it predicts. In this section, we look at the evidence for considering whether emotional intelligence is indeed a form of intelligence. For an intelligence to be considered a standard intelligence, it must meet certain criteria. It must be reliable, of course. Beyond that, tasks that are believed to measure the intelligence must be correlated with one another. In addition, the candidate for an intelligence must be related to, but also independent of, other existing intelligences. Finally, the intelligence must develop with age.

Reliability of Ability Measures of Emotional Intelligence

Earlier, we indicated that early tasks measuring emotional perception suffered from low reliability. Our newer multiple-scale measures of emotional intelligence, the MEIS and MSCEIT, indicated that this mental ability can be reliably measured. The four MEIS branch scores (perception, facilitation, understanding, and management) had coefficient alphas ranging from .81 to .96, with a full-scale internal consistency of .96. The initial, research version of the MSCEIT had branch score alphas from .59 to .87 (based on 277 participants). These levels will rise as poorly performing test items are dropped during revision of the test (Mayer, Salovey, & Caruso, 1999b). The internal consistencies of the MEIS and MSCEIT are comparable to many standard tests of intelligence.

There are also a number of individual tasks on the MEIS (or item clusters on the MSCEIT) that are internally consistent. For example, the four MEIS emotional perception subscales' alphas ranged from $\alpha = .85$ to $.94$ (identifying emotions in faces, $\alpha = .94$; music, $\alpha = .90$; designs, $\alpha = .85$; stories, $\alpha = .89$). The MEIS subscales with the lowest alphas, $\alpha = .49$ and $.51$, had only eight items each. Because reliability is a direct function of length (other factors held constant), these alphas can be drastically improved by adding items. The low reliabilities found by Davies et al. (1998) were comparable, albeit somewhat lower, than those we have found with our early (and rather short) scales. We expect that if Davies et al. evaluate our present scales, they will find them of adequate reliability. In fact, an independent study using the MEIS indicated that its overall internal consistency is $\alpha = .90$ (Ciarrochi, Chan, & Caputi, 2000).

Structure of the MEIS

The structure of emotional intelligence can be inferred from a study of the intercorrelations among the twelve MEIS tasks (preliminary results from the MSCEIT provide a similar picture). If all the ability tasks rise and fall in lock-step across people, they are assumed to measure one thing. If there are several clusters of tasks, each of which rises and falls independently, then the scale is said to measure several different intelligences. Factor analyses indicate that emotional intelligence can be represented as a two-level hierarchy. At the top of the hierarchy is an overall emotional intelligence factor that represents a fairly cohesive group of skills. Although all of the ability tasks rise and fall together, emotional intelligence can be broken down further into four subsidiary factors representing emotional perception, emotional facilitation, emotional understanding, and emotional management. Findings with the MEIS are supportive of the four-branch model of emotional intelligence (Mayer & Salovey, 1997), that is, that there is an overall emotional intelligence that can be broken down into several subsidiary groups of skills (Mayer, Caruso, & Salovey, 1999, study 1).

Emotional Intelligence and Other Intelligences

The MEIS is somewhat related to—but still reasonably independent of—verbal intelligence. The correlation between the MEIS, in a sample of 503 adults, and a vocabulary measure was $r = .36$ ($p < .01$), and it was $r = .45$ ($p < .01$) in a sample of about 200 adolescents (Mayer, Caruso, & Salovey, 1999). However, the MEIS may not be related to other, nonverbal, types of intelligences. For instance, Ciarrochi et al., (2000) found that the MEIS was unrelated to their measure of IQ, the Raven Progressive Matrices ($r = .05$, n.s.). The Raven is generally considered to be a measure of performance or spatial intelligence, as opposed to verbal intelligence. Such findings indicate that emotional intelligence may be related to other specific intelligences to varying degrees. These correlations indicate that the MEIS measures different things than do these other intelligence tests, although there is some relationship between them. Typically, intelligence tests correlate with each other between $r = .50$ and $.80$ (see, for instance, Matarazzo, 1972).

Emotional Intelligence and Development

In absolute terms, adults outperform adolescents in detecting consensus answers on the MEIS (Mayer, Caruso, & Salovey, 1999, study 2). Age differences in an ability measure of emotional intelligence that was based on the MEIS (the Emotional Intelligence Scale for Children [EISC]) were also obtained for a sample of 100 children (Sullivan, 1999).

WHAT DOES EMOTIONAL INTELLIGENCE PREDICT?

As the previous section demonstrates, emotional intelligence, defined as an ability, can be measured reliably. Moreover, multiple tasks of emotional intelligence are correlated, forming a single, emotional intelligence factor. As we indicated earlier, one of the criticisms of self-report measures of emotional intelligence is that these tasks measure the same thing as do self-report scales of general personality. We next examine to what degree emotional intelligence overlaps with other aspects of personality, and whether it predicts behavioral outcomes.

Emotional Intelligence and Personality

Relationship Between Ability and Self-Report Emotional Intelligence. In work comparing the MSCEIT scores with those of the BarOn EQ-i, a self-report measure of emotional intelligence (Bar-On, 1997), the overall test-to-test correlation in a subsample of 137 was $r = .36$, which indicates the two tests share about 10 percent of their variance in common.

Empathy. Emotional intelligence (measured by the MEIS) correlates with self-reported empathy ($r = .33$, $p < .01$, Mayer, Caruso, & Salovey, 1999; $r = .43$, $p < .01$, Ciarrochi et al., 2000). Sullivan (1999) found that the EISC ability measure correlated about .35 with children's self-reported empathy. Rubin (1999) administered an adolescent version of the MEIS (the AMEIS) to fifty-two seventh and eighth grade students in an urban school district. She found a significant association between emotional intelligence and empathy ($r = .28$, $p < .05$).

Parental Warmth. Studies with the MEIS indicate that emotional intelligence is significantly related to self-reported parental warmth ($r = .23$, $p < .01$, Mayer, Caruso, & Salovey, 1999; $r = .18$, $p < .05$; Ciarrochi et al., 2000). These findings are important because of the large emphasis we and others have placed on developmental antecedents of emotional intelligence (Mayer & Salovey, 1995; Salovey & Sluyter, 1997).

Life Satisfaction Measures. Ciarrochi et al. (2000) found that people scoring higher on the MEIS had higher levels of life satisfaction ($r = .28$, $p < .05$), and of self-reported relationship quality ($r = .19$, $p < .05$).

Broader Aspects of Personality. Ciarrochi et al. (2000) found that the MEIS correlated at low to moderate levels with tests of extroversion ($r = .26$, $p < .05$), openness to feelings ($r = .24$, $p < .05$), and self-esteem ($r = .31$, $p < .05$). Similarly, a series of studies in our own laboratory shows that the MEIS is relatively independent of many of the self-report trait scales of personality as measured by the omnibus personality measure, the 16 PF (Mayer, Caruso, Salovey,

Formica, & Woolery, 2000). In 186 college students, we found that the MEIS full-scale score correlated as follows with each of the 16 PF scales: .13, n.s., with Warmth; .19, $p < .05$ with Reasoning; .09, n.s., with Emotional Stability; .05, n.s. with Dominance; .12, n.s., with Liveliness; .02, n.s., with Rule-Consciousness; $-.02$, n.s., with Social Boldness; .22, $p < .01$ with Sensitivity; $-.17$, $p < .05$ with Vigilance; $-.01$, n.s., with Abstractedness; $-.10$, n.s., with Privateness; .09, n.s., with Apprehension; .14, $p = .05$ with Openness to Change; $-.21$, $p < .01$ with Self-Reliance; $-.11$, n.s., with Perfectionism; and .01, n.s., with Tension. Importantly, the MEIS correlated .01 with the Impression Management Scale of the 16 PF. Likewise, the scales of the MSCEIT are, encouragingly, almost entirely unrelated to the Positive Impression scale of the EQ-i (.16, n.s.).

The individuals in our recent study also completed the Fundamental Interpersonal Orientation Scale-Behavior (FIRO-B; Schutz, 1978), a self-report measure of social skills and needs. The full-scale MEIS correlated .14, n.s., with expressed Inclusion (which measures how much the subject expresses interest in people in general), $r = .22$, $p < .01$ with wanted Inclusion (how much a subject desires to be with people), $r = .05$, n.s. with expressed Affection (a measure of how warm a person is toward others), $r = .19$, $p < .01$ with wanted Affection (how much closeness a person desires with others), $r = -.09$, n.s. with expressed Control (the amount of responsibility and decision making in which the person engages), and $r = -.05$, n.s. with wanted Control (how much structure or direction the person desires). A brief mood scale administered to these respondents correlated $r = -.09$, n.s. with total MEIS scores.

Emotional Intelligence and Behavior

We have stated that emotional intelligence, as a mental capacity or set of abilities, is best measured with a performance measure. However, any intelligence is usually of interest because of its relationship with observable, and important, outcomes. In this section, we examine the preliminary evidence that relates emotional intelligence to outcomes and behaviors.

Emotional Intelligence and Reductions in Behavior Problems and Violence.

The studies in our laboratory (Mayer, Caruso, et al., 2000) also employed measures of participants' life space—a person's description of his or her activities, behaviors, and surrounding environment (Mayer, Carlsmith, & Chabot, 1998). These investigations indicated, tantalizingly, that the MEIS may be associated with lower self-reports of violent and trouble-prone behavior among college students, with correlations of test to life space in the $r = .40$ range. This relation remained significant even after measures of analytic intelligence and empathy were partialled out. Such findings indicate that emotional intelligence is measuring unique variance.

In another study, Rubin (1999) collected teacher and peer ratings of aggression and prosocial behavior. The peer ratings included a measure of direct, overt

aggression (such as hitting a child or insulting a child) and relational aggression (such as excluding a child). Teacher-rated aggression was not significantly related to total AMEIS scores ($r = -.21$), although the association was in the appropriate direction, and the stories subtest was significantly correlated ($-.37, p < .01$). However, peer-nominated direct aggression ($r = -.39, p < .01$), peer-nominated relational aggression ($r = -.37, p < .01$), and peer-nominated combined aggression ($r = -.48, p < .001$) were all significantly related to AMEIS scores.

Prosocial behavior, as measured by teacher ratings, was also highly related to emotional intelligence ($r = .49, p < .001$), but overall AMEIS scores were not significantly related to peer-nominated prosocial behavior ($r = .26, n.s.$), although the correlation was in the appropriate direction, and specific subtests were significantly related (stories and managing emotions).

Observer Ratings of Emotional Intelligence. Sullivan's EISC had modest correlations with teacher ratings of children's combined emotional Recognition and Response ($r = .23, p < .05$), and with combined teacher and parent ratings ($r = .35, p < .01$), although not with the parents' ratings alone (Sullivan, 1999).

Emotional Intelligence and Team Performance. Rice (1999) suggests that emotional intelligence plays a role in certain aspects of effective team leadership and team performance. She administered a short form of the MEIS to 164 employees of an insurance company, who staffed twenty-six customer claims teams, as well as to eleven of their team leaders. One of the two department managers rated her teams and her team leaders on five variables: customer service, accuracy of claims processing, productivity, commitment to continuous improvement, and team leader overall performance. The MEIS scores of the eleven team leaders correlated $r = .51$ with the department manager's ranking of those leaders' effectiveness. The emotional intelligence of the twenty-six teams, as measured by the average MEIS score across team members, was significantly related to the department manager's ratings of the team performance for customer service ($r = .46$). In other areas, emotional intelligence did not seem to help and may have even hurt some teams. For example, higher team leader emotional intelligence, as measured by the MEIS, was negatively related to the team's accuracy ($r = -.35$) and productivity ($r = -.40$) in handling customer complaints.

APPLICATIONS OF ABILITY MEASURES OF EMOTIONAL INTELLIGENCE

Our enthusiasm for an ability approach to emotional intelligence is due to several factors. The first is that we believe that these scales are measuring a set of abilities, an actual intelligence. Second, as such, these scales are measuring

something that is new and unique: we are not simply measuring "people skills," extraversion, or emotional stability. Third, ability measures are less susceptible to response bias, socially desirable responding, or "faking" than are self-report or informant approaches to measurement. Although we are just at the beginning of the learning curve in this area, we do believe that enough data exist for us to encourage researchers and practitioners to consider an ability measure of emotional intelligence in their work.

Clinical Assessment

Clinicians regularly employ standard measures of general intelligence and broad-based personality traits. An ability measure of emotional intelligence may yield new information about a client's potential functioning. The MEIS or MSCEIT can provide information on clients' emotional resources: what do they know about emotions; are they able to identify their own and other's emotions accurately; are effective emotion management strategies available to them? We envision a time when clinicians will be able to enhance their prediction of clients' therapeutic progress, based in part on their emotional intelligence abilities.

Education

Ability measures of emotional intelligence appear to predict prosocial behavior and the absence of negative behavior among adolescents and young adults. If these emotional intelligence abilities play a role in such important areas of functioning, then it is good news for educators and parents. An ability approach to emotional intelligence can focus on skill development or knowledge acquisition, as opposed to the enhancement of personality. Such an ability focus seems to be more clearly connected with education (Salovey & Sluyter, 1997).

Workplace

Leading and managing people require technical skills as well as emotional skills. One difficulty for workplace settings is to create tests that employees and managers are willing to take. We have found in our field work with managers that they respond positively to an ability approach to emotional intelligence; they recognize that the ability to "read" people is an important ingredient in their management effectiveness. When they are asked to take the MEIS and identify the facial expressions of people, they connect this to their day-to-day work. (See Caruso, Mayer, & Salovey, forthcoming, for a discussion of emotional intelligence and leadership.) Team effectiveness research and training will also likely benefit from an ability approach to emotional intelligence. Although personality traits, such as agreeableness, have been examined, emotional knowledge and skills may provide new information on high-performance teams. As the study by Rice (1999) indicated, this relationship is likely a complex and interesting one.

CONCLUSION

There are a number of scales of emotional intelligence. These can be distinguished according to the way they define emotional intelligence and the measurement approach they employ. We view emotional intelligence as a form of intelligence that combines emotions and thinking. Tests of emotional intelligence that examine outcomes (such as leadership or teamwork) or noncognitive traits (such as assertiveness or impulse control) seem to tap a dimension of personality that is different from the idea of an intelligence. Such content may be more similar to existing personality models or scales.

We believe that an intelligence is best measured with performance, or ability, measures. This is the approach we have taken in the development of our scales of emotional intelligence. Our theory of emotional intelligence divides emotional intelligence into four areas of abilities: emotional perception, emotional facilitation, emotional understanding, and emotional management (Mayer & Salovey, 1997).

Our ability tests—the MEIS and MSCEIT—measure each of these four areas. Although some early ability scales of emotional intelligence lacked internal consistency, our more recent scales measure emotional intelligence at an adequate level of internal consistency and reliability. Research with these scales indicates that emotional intelligence—defined and measured as an ability—is related to, but mostly independent from, other intelligences. Emotional intelligence is also independent of many of the personality traits that we and others have studied, such as dominance and neuroticism.

The exploration of what emotional intelligence, modeled and measured as an ability, predicts has just begun. Nonetheless, the MEIS and MSCEIT have interesting and important relationships with behaviors and other outcomes. For example, emotional intelligence scores correlate with teacher-parent evaluations of children's abilities to recognize and respond emotionally. Emotional intelligence may play an interesting role in team effectiveness and customer service. Finally, preliminary evidence suggests that emotional intelligence appears to be associated with reductions in violent and related problem behavior.

Plainly, much more research will be needed to understand the ability approach to emotional intelligence's contribution to personality development and growth. Investigators have just begun to examine cross-cultural issues, the development of emotional intelligence, and the application of emotional intelligence in clinical, educational, and workplace settings. As we continue to explore emotional intelligence, we hope that our preliminary studies will continue to be successful. But to be successful, further studies must insure that the scale of measurement is not an afterthought, but part of a well-conceptualized and well-designed research program. If emotional intelligence is an intriguing

set of mental abilities, then we believe that it must be measured as an intelligence, and that the way to achieve this goal is with ability measures.

NOTES

All correspondence regarding this chapter may be addressed to John (Jack) D. Mayer, Department of Psychology, University of New Hampshire, Durham, NH 08324. Electronic mail may be sent to jack.mayer@unh.edu.

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