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CHAPTER

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Measuring Emotional Intelligence: Paradigmatic Diversity and Common Ground

In 1990, Peter Salovey and John Mayer published an article [1] that has since served as the academic foundation for research on Emotional intelligence (EI). In that landmark article, these researchers synthesized the (then) disparate fields of emotion and intelligence into a unifying theory that would pave the way for a great deal of theoretical and empirical work over the past 15 years. They defined EI as “the ability to monitor one’s own and others’ feelings and emotions, to discriminate among them and to use this information to guide one’s thinking and actions” [1, p. 189]. In the same year, they published a second article on EI, which provided an initial empirical demonstration of how EI might be measured and how individual differences in EI might predict important things about a person’s life, including the ability to respond empathically to others [2].

Since Salovey and Mayer’s [1] introduction of EI to the academic literature, the definitions of EI across time and across researchers have varied. In a recent thorough review of the EI literature, Matthews, Zeidner, and Roberts [3] delineate the particulars of several different conceptualizations of EI and recommend that EI researchers move toward a more consensual model. For instance, they explain the current predominant “ability” model of EI espoused by Mayer and Salovey [4], which proposes that four fundamental emotion-related abilities comprise EI, including (a) perception/expression of emotion, (b) use of emotion to facilitate

thinking, (c) understanding of emotion, and (d) management of emotion in oneself and others. They also describe an alternative model by Bar-On [5], which suggests that the fundamental areas of EI are intrapersonal skills, adaptability, stress management, and general mood. Clearly, these conceptualizations differ.

□ Models of Emotional Intelligence

To provide clarity, two organizational schemes have been developed to categorize different classes of EI theories and measurement tools. Mayer, Salovey, and Caruso [6] discuss the distinctions between “ability” and “mixed” models of EI. Ability models conceptualize EI as a set of mental abilities or skills that pertain to the accurate processing of emotion-relevant information. For instance, Mayer et al. [6] discuss the ability to manage one’s own emotions (e.g., having the ability to calm down after being angered) as an element of EI. In fact, their model [6] and new performance test, the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT [7]) is comprised exclusively of such psychological abilities.

In contrast, mixed-models focus on self-perceived abilities, skills, and personality traits. For instance, Bar-On’s [5] model of EI includes an emotion-related ability such as “stress tolerance” and basic personality traits such as “optimism.” Because both perceived abilities and traits are in the conceptual framework, proponents of this approach have generally employed self-report measures as opposed to performance measures to assess EI. On the Emotion Quotient Inventory (EQ-i [5]), for example, “stress tolerance” is conceptualized as a fundamental ability underlying EI; however, the EQ-i only measures one’s perceived ability, and not one’s actual ability to tolerate stress.

Petrides and Furnham [8] use a slightly different scheme by referring to “ability EI” versus “trait EI.” In their framework, ability EI corresponds to models, such as the one by Mayer et al. [6], that underscore the importance of cognitive abilities in defining EI. Alternatively, trait EI corresponds to models, which emphasize traits that are relevant to individual differences in emotional processes. According to Petrides and Furnham [8], these different models of EI are so conceptually different that they warrant different names. They further argue (and we agree) that such different models should, in fact, not exist under the same semantic umbrella. From their perspective, EI scholars should work toward the development of two fully separate classes of constructs: trait EI and ability EI.

In addition to mixed- or trait-based and ability measures, Brackett et al. [9] developed self-report scales that map directly onto performance tests such as the MSCEIT. These researchers developed the Self-Rated

Emotional Intelligence Scale (SREIS) in order to test the relationship between people's beliefs about their emotion-related abilities (i.e., the perception, use, understanding, and management of emotion) and their actual knowledge about or reasoning capacity with these abilities.

In spite of the heterogeneity among EI measures, several core constructs seem to emerge among the different conceptualizations of EI. Matthews et al. [3] provide a definition of EI that encompasses aspects of several current models of EI. They define EI as "the competence to identify and express emotions, understand emotions, assimilate emotions into thought, and regulate both positive and negative emotions in the self and others" [3, p. 3]. While this definition maps most closely onto Mayer, Salovey, and Caruso's [6] ability model, all models of EI address these basic elements in varying degrees. Accordingly, an emotionally intelligent individual is capable of knowing how others feel, understanding how he or she feels him or herself, using emotions adaptively to make decisions, and regulating emotions effectively in intrapersonal and interpersonal contexts.

Because there are a number of ways of assessing EI, including performance and self-report measures, it is important to consider the distinctions among the different EI tests. In this chapter we review and examine the reliability and validity of some of the most widely used EI measurement tools. We also report on their intercorrelations (when available), whether the EI tests are distinguishable from other mental abilities and well-established personality attributes, and whether they predict important aspects of everyday life, including psychological health and adaptive behavior.

□ Issues Regarding the Measurement of Emotional Intelligence

In their early conceptual writing about EI, Salovey and Mayer [1] knowingly anticipated and considered the empirical study of the construct. They discussed issues regarding the utility of EI, stating "[conclusions regarding this construct] await the findings of well designed experiments and correlational studies" [1, p. 201]. Given the nature of empirical work in psychology, strategies for measuring EI thereby became necessary.

Several issues that underlie EI measurement became apparent as researchers tried to operationally define the construct and its corresponding elements. First, researchers needed to create measures that corresponded accurately to their particular EI conceptualizations. For adherents of ability-based models, that implied the need for "performance measures." A performance measure of EI is an index of EI that assesses individual differences in specific emotion-relevant abilities. The Emotional Accuracy Research Scale (EARS [10], [11]) was one of the first such performance measures of EI. This scale was designed to tap the emotion-identification

component of EI by having participants rate the emotions of targets who had written emotionally laden vignettes. In general, higher scores were thought to indicate more ability in identifying emotions of others. The scoring system of this and other performance measures will be described in more detail later.

For adherents of mixed-models of EI, there was also a need to create measures. Generally, researchers working in this tradition have leaned toward self-report indices, a method that is quite common in the measurement of personality traits. For instance, Bar-On [5] developed the EQ-i to tap his largely trait-based model of EI. The EQ-i includes self-report items designed to tap 15 subscales that are thought to comprise five higher order EI domains.

Basic Psychometric Issues Pertinent to Emotional Intelligence Measurement

From a measurement perspective, indices of EI should be both reliable and valid. A useful EI measure should exhibit test-retest reliability (i.e., yield similar scores in the same participants across time) and high internal reliability (i.e., the items in the scale should be positively intercorrelated). Such a measure should have content validity (i.e., include items that reasonably tap the multiple conceptual facets of the construct) and convergent validity (i.e., correlate positively with other EI measures). Further, such a measure should demonstrate discriminant validity (i.e., be either uncorrelated or only modestly correlated with conceptually distinct measures such as the Big Five personality traits). Similarly, a good EI index should demonstrate incremental validity (i.e., account for variability in important outcomes after competing predictor variables are statistically controlled for). Also, from a utilitarian standpoint, a good EI measure should have criterion validity (i.e., scores should predict both psychological and behavioral outcomes that are conceptually related to EI). For a broader and more in-depth analysis of psychometric issues applied to EI, see [12].

Psychometric Qualities and Validity of Different EI Measures

A good deal of research on the validation of EI measures has been conducted. Here, we provide a summary of the psychometric findings for many of the widely used EI measures. These measures are summarized in

Table 2.1. Consistent with recent the literature on EI (e.g., [6], [8–9], [20]), we organize this section into performance-based and self-report indices of EI.

Performance Measures of EI

In this section we briefly review some of the best-known EI performance tests that were designed to tap aspects of Mayer et al.'s [6] model of EI. Due to our focus on current measures of EI, we direct the reader elsewhere [3–4], [21] for reviews of related ability tests, including the Levels of Emotional Awareness Scale (LEAS [22]) and the Diagnostic Assessment of Non-Verbal Affect—Adult Facial Expressions (DANVA-AF [23]). Here, we review the EARS (Emotional Accuracy Research Scale [11]) and the MSCEIT (Mayer-Salovey-Caruso Emotional Intelligence Test [7]).

EARS

The Emotional Accuracy Research Scale (EARS) was designed to measure the emotion-perception component of the ability model by having participants try to identify which emotion (of two options presented across several items) particular targets reported feeling. Emotionally laden stories written by actual targets were used as the basis of participants' judgments. For each participant, two EI scores were computed. The *target-agreement* score corresponded to the degree to which participants' choices matched the actual judgments of the targets themselves. The *consensus-agreement* score corresponded to the degree to which participants' choices were consistent with the group consensus. A weighted-consensus scoring procedure was implemented such that participants' consensus scores increased more for choosing options that were highly popular among the group of judges compared with options that were less popular among the judges.

The initial version of the EARS [11] demonstrated some promise; however, findings regarding the psychometric properties of the EARS also raised some concerns. The internal reliability coefficients (Cronbach's alphas) for the target and consensus subscores were .24 and .53, respectively. These coefficients are, indeed, poor by any standards. In spite of such poor internal reliability, the EARS demonstrated some convergent validity across two studies. In particular, consensus scores were positively related to self-reported empathy ($r = .24$) and the ability to agree with a consensus regarding emotion judgments of targets presented in dynamic video-based presentations (e.g., $r = .36$; see [13]).

TABLE 2.1. Summary of several indices of emotional intelligence in adults

| <i>Performance measure</i> | <i>Relevant recent publication</i> | <i>Brief measure description</i> | <i>Facets of EI included</i> |
|---|------------------------------------|--|---|
| EARS Emotional Accuracy Research Scale | [10–11], [13] | An early performance measure of emotion-perception ability; participants read emotionally laden stories and make judgments regarding how the targets of several emotionally laden stories felt; agreement-with-target and agreement-with-consensus scores are computed | Ability to accurately perceive emotions in others (i.e., the emotion-perception branch of the ability model) |
| MSCEIT Mayer-Salovey-Caruso Emotional Intelligence Test | [14–15] | The newest index of the ability-model version of EI; can be scored in terms of both agreement with a broad consensus and agreement with judgments from emotion experts; participants make judgments regarding several emotion-relevant stimuli (such as how much fear a particular face demonstrates on a 1–5 scale) | Ability to accurately perceive emotions in oneself and others, use emotions to facilitate thinking, understand emotional meanings, and to effectively manage emotions |
| <i>Self-report measures</i> | | | |
| SSRI Schutte Self-Report Inventory | [16] | A self-report inventory designed, in part, to map onto the initial ability-based model of EI [1] | Overall EI, emotion perception ability, emotion utilization ability, self-relevant emotion-management ability, other-relevant emotion-management ability |
| TECI-2 Emotional Competency Inventory | [17] | A 360° survey to be completed by target individuals in addition to several relatively close observers of said targets (e.g., supervisors); separate <i>self</i> and <i>other</i> assessment scores can be computed | Self-awareness, self-management, social awareness, social skills (each cluster includes both <i>self</i> and <i>other</i> components); further, each cluster includes multiple competencies with 18 competencies in all |
| EQ-i Emotional Quotient Inventory | [18–19] | An index of EI that requires participants to describe themselves (using a Likert scale) in terms of several emotion-relevant judgments pertaining to Bar-On's model of EI | Interpersonal skills, interpersonal skills, stress management, adaptability, general mood (as with the ECI, the EQ-i includes subscales tapping each of these five broader dimensions with 15 total subscales) |
| SREIS Self-Rated Emotional Intelligence Scale | [9] | A self-rated inventory designed to map onto the MSCEIT | Self-rated ability to perceive emotion in faces, use emotion to facilitate thought, understand emotions, and manage emotions |

MSCEIT

Research by Mayer and his colleagues [7], [24] has resulted in two performance tests that measure the four emotion-related abilities captured by Mayer and Salovey's [4] EI theory (i.e., the perception, use, understanding, and management of emotion). The first such test was the Multifactor Emotional Intelligence Test (MEIS [24]). Although the MEIS was reliable, distinctive, and related to important outcomes, the test was quickly improved upon, leading to a briefer EI test that was produced professionally, the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT, v. 2.0 [7]).

The MSCEIT assesses the four-domain model of EI with 141 items that are divided among eight tasks (two for each domain). The test yields seven scores: one for each of the four domains, two area scores, and a total EI score. The two area scores are termed: Experiential EI (domains 1 and 2 combined) and Strategic EI (domains 3 and 4 combined). Experiential EI indicates the degree to which an individual "takes in" emotional experiences, whereas strategic EI indicates the degree to which an individual understands and uses emotion skills strategically for planning and self-management. The first domain of EI, *perceiving emotions*, is measured by asking individuals to identify the emotions expressed in photographs of people's faces ("faces") as well as the feelings suggested by artistic drawings and landscapes ("pictures"). The second domain of EI, *use of emotion to facilitate thought*, is measured by two tests that assess people's ability to describe emotional sensations and their parallels to other sensory modalities using a nonfeeling vocabulary ("sensations"), and to identify the feelings that might facilitate or interfere with the successful performance of various cognitive and behavioral tasks ("facilitation"). The third domain of EI, *understanding emotion*, is measured by two tests that pertain to a person's ability to analyze blended or complex emotions ("blends") and to understand how emotional reactions change over time or follow up on one another ("changes"). Finally, the fourth domain of EI, *managing emotion*, has two subtests that assess how participants manage their own emotions ("emotion management") and how they would regulate the emotions of others ("social management").

The MSCEIT is a performance-based test because there are better and worse answers on it, as determined by consensus or expert scoring. Consensus scores reflect the proportion of people in the normative sample (over 5000 people from various parts of the world) who endorsed each MSCEIT test item. In consensus scoring, responses are tallied from the normative sample, and respondents are given credit for "correct" answers to the extent that their answers match those provided by the normative sample (i.e., a representative sample from the general public).

Response scores are weighted by the proportion of the normative sample that also provided that answer. Norms can also be calculated for certain subgroups, including college students and mental health professionals. Expert norms were obtained from a sample of 21 members of the International Society Research on Emotions (ISRE) who provided their expert judgment on each of the test's items. In both scoring methods respondents receive credit for correct answers to the extent that they match those of the normative sample or experts. For example, if 65% of the expert samples say that there is a moderate amount of happiness in a face and a person chooses that answer that person's score is incremented by .65. The correlations among the domain, area, and total scores based on the two scoring methods are quite high across studies, $r_s > .90$ [7], [25] and correlations with objective criteria such as social deviance (e.g., number of physical fights, stealing behavior) are also replicated across the two scoring methods [20].

The MSCEIT is reliable at the full-scale level and at the area and branch levels [25]. In a recent study using a large portion of the MSCEIT standardization sample (approximately 2000 individuals), Mayer et al. [25] reported full-test split-half reliabilities greater than .90 for both consensus and expert scoring. Reliabilities for the two area scores (experiential and strategic EI) were also above .86 for both scoring methods. The reliabilities of the four domain scores (perceiving, using, understanding, and managing emotions) for both methods of scoring were between .76 and .91. The reliabilities of the task scores, which the test authors do not recommend using, were somewhat lower (.55–.88). The test–retest reliability of the full-test over a 3-week period was .86 [20].

The MSCEIT also has a factor structure congruent with the four-domain model of EI. Using a large portion of the standardization sample, Mayer et al. [25] performed confirmatory factor analyses on the eight tasks measured by the MSCEIT. They tested for one-, two-, and four-factor models to examine the range of permissible factor structures. The best fit was the four-factor solution as evidenced by the following goodness-of-fit indices (NFI = .98, .97; TLI = .96, .97; RMSEA = .05, .04). The findings were the same for both consensus and expert scoring methods.

Although research is still in its early stages, a number of studies have shown that the MSCEIT is valid measure of EI. First, it appears to show appropriate discriminant validity from measures of analytic intelligence and personality. MSCEIT scores are related to, but not redundant with a range of intelligence measures (r_s in the .30–.45 range), including verbal SAT scores [26], the WAIS-III vocabulary subscale [27], and the Wonderlic Personnel Test [28–29].

With respect to personality, the MSCEIT is significantly related to, but not redundant with the Big Five personality traits. Mayer et al. [15]

summarized research with over 1500 participants that examined correlations between MSCEIT scores and Big Five traits. All of the weighted mean correlations were below $r = 1.211$. MSCEIT scores are also unrelated to social desirability or mood, and personality scales such as public and private self-consciousness, and self-esteem [27].

MSCEIT scores also are related to important psychological variables, including psychological health and well-being, particularly perceived personal growth and positive relations with others ($r_s = .36, .27$, respectively [20], [27]). Moreover, MSCEIT scores are negatively related to indices of depression and anxiety ($r_s = -.25, -.31$, respectively [28]). With respect to everyday life behaviors, lower MSCEIT scores, for men in particular, are related to maladaptive outcomes, including illegal drug and alcohol use, deviant activity, and poor relations with friends, $r_s = -.28$ to $-.45$ [26].

MSCEIT scores (especially the managing emotions subscore) also are associated with various indicators of positive social relations, including global self-perceived quality of interpersonal relationships, supportive relationships with parents, and less antagonistic and conflictual relationships with close friends (r_s in the $.20$ – $.30$ range [27]). In addition, MSCEIT scores are positively related to peer reports of relationship quality outcomes, including emotional support and less conflict [30]. Two studies examining whether MSCEIT scores were related to couples' relationship quality also have shown that couples with partners who were both low in EI tended to have poorer quality relationships than couples who were both high in EI [31–32].

Research on EI in the workplace suggests that the MSCEIT positively contributes to some, but not all aspects of job performance. Individuals with higher MSCEIT scores appear to exhibit better vision formulation and articulation, $r = .23$ [33], receive better supervisor ratings of job performance, $r = .22$ [34], and obtain higher ratings of customer satisfaction, $r = .46$ [35]. MSCEIT total and branch scores are also related to merit increases ($r = .36$) and peer ratings of positive work environment ($r = .48$) [36] as well as higher leadership effectiveness [37]. However, in one study, MSCEIT managing emotions scores were significantly lower for the highest ranked and highest paid among 59 senior executives in a large international organization [38]. Because the sample sizes in the above workplace studies were small, the results should be interpreted as preliminary.

The relation between MSCEIT scores and school grades is still undetermined. Studies have found associations in the $.20$ – $.25$ range among college students; see [20], [39], but the correlations drop to nonsignificance when verbal ability is statistically controlled for. One study in Spain, however, using a sample of 80 high school students reported a zero-order correlation of $.46$ between MSCEIT scores (assessed at the beginning of

the academic year) and end-of-the-year grades [40]. This association remained statistically significant after controlling for general intelligence ($r = .36$). It is possible that association between EI and grades is stronger for high school students than for college students because academic grades are less restricted in high school samples. Nevertheless, more research is needed to examine the role of EI in academic contexts.

In sum, according to Mayer et al. [24–25] the MSCEIT meets classical criteria for an intelligence test because: (a) its factor structure is congruent with the four domains of the theoretical model; (b) the four abilities show unique variance and are meaningfully related to other mental abilities such as verbal intelligence; (c) scores on the test develop with age and experience, (d) the four abilities are objectively measured, and (e) the test predicts important behavioral criteria.

Overall, the MSCEIT shows considerable promise as a performance measure of EI. However, more research is necessary to examine its psychometric properties and validity. For example, Day [41] calls for an examination of the scoring of the MSCEIT. Because scores on the test are determined by matching individual scores to those of the normative sample, there is concern that one's EI score on the MSCEIT measures the "norm" rather than high EI. Other concerns are that the test measures culturally shaped emotional knowledge as opposed to emotion abilities as they function during actual usage [3]. Finally, it will be necessary to test whether the MSCEIT total score and the individual domain scores predict a wide range of theoretically related outcomes in various settings.

Self-Report Measures of EI

As mentioned earlier, self-report measures of EI require participants to describe themselves on Likert-scale items. These scales rely on the individual's self-understanding. Thus, if the person's self-concept is accurate, then such scales can be used as accurate measures of emotion-relevant traits or EI ability. However, one problem with self-report indices of mental skills is that people are generally poor at assessing their own mental abilities [42–43]. Self-report scales may also be modified to a 360° format. In this case, a particular target's score is based separately on his or her own self-report in addition to reports provided by observers (informants) who are highly familiar with the target, including peers, direct reports, and supervisors. Informant reports generally measure a person's reputation.

In this section we review the three best-known self-report measures of EI, including the Schutte Self-Report Inventory (SSRI [16]), the Emotional Quotient Inventory (EQ-i [5]), and the Emotional Competency Inventory (ECI [44]; see also [17]), which employs a 360° measurement

strategy. We also review a new measure, the Self-Rated Emotion Intelligence Scale (SREIS [9]). As noted earlier, this instrument was developed to map onto the MSCEIT so the direct relationship between self-rated and ability EI could be examined. We direct the reader elsewhere [21] for a review of other well-known measures that assess perceived emotion-related abilities and traits captured by mixed or trait-based models of EI. These measures include the Trait-Meta-Mood-Scale (TMMS [45]) and the Toronto Alexithymia Scale (TAS-20 [46]).

SSRI

The SSRI is a brief self-report measure developed by Schutte et al. [16]. The authors originally wrote a pool of 62 items that were largely based on their understanding of Salovey and Mayer's [1] model of EI. For example, they included items such as, "I am aware of my emotions as I experience them to measure emotion perception. Factor analysis of the initial 62 items resulted in a single-factor 33-item scale. The internal and test-retest reliabilities of the SSRI total score are high, $\alpha_s = .93$ and $.73$, respectively [16].

The structural validity of the SSRI is questionable, however. Petrides and Furnham [8] assert that the SSRI is not unidimensional and that the scale does not map onto Salovey and Mayer's [1] model of EI, as claimed by the authors of the scale [16]. Petrides and Furnham [8] prefer the result of their own exploratory factor analysis, which divided the SSRI into four provisional factors (optimism and mood regulation, appraisal of emotions, social skills, and utilization of emotion). The reliability of some subscales (e.g., utilizing emotions) is quite low, however [47]. Other researchers prefer a three-factor solution [48]. Finally, Brackett and Mayer's [20] factor analysis of the SSRI resulted in only one interpretable factor pertaining to the perception or appraisal of emotions.

A few studies have examined the discriminant validity of the SSRI with respect to conventional personality inventories and measures of well-being. The test is significantly related to each of the Big Five traits (extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience) in predictable directions (e.g., negatively correlated with neuroticism). The magnitudes of these correlations are not large enough to suggest construct redundancy [20], [48]. The SSRI does appear to overlap greatly with other conceptually related constructs including psychological well-being and alexithymia. For example, the correlation between the SSRI and alexithymia is $-.65$ [16], and when Ryff's [49] scales of psychological well-being were regressed onto the SSRI total score, the multiple R was $.70$ [20]. These findings suggest that the SSRI has high semantic overlap with conventional self-report measures of well-being and does not assess much beyond these measures.

A number of studies have tested the validity of the SSRI in relation to both psychological and behavioral outcomes. For instance, scores on the SSRI have been related to emotion-relevant outcomes such as attention to feelings and impulse control [16]. In the original study, the SSRI predicted end of the year GPA and discriminated between groups expected to be higher and lower in EI. Specifically, women scored higher than men, and therapists scored higher than both prisoners and psychotherapy patients. The association between the SSRI and college GPA was not replicated, however [20].

The SSRI also correlates with measures of interpersonal relationship quality, including empathic perspective taking, social skills, marital satisfaction, and supervisor ratings of student counselors who worked at mental health agencies [50]. For example, Schutte et al. [50] found that the SSRI correlated with reports of marital satisfaction ($r = .51$). These studies, however, did not examine the incremental validity of the SSRI after controlling for established measures, such as well-being. Finally, one study found that the SSRI was not predictive of maladaptive behavior (e.g., drug use) in a large sample of college students [20].

Based on our review of the literature, the utility of the SSRI as a self-report measure of EI is questionable. Independent factor analyses of the measure have resulted in one-, three-, and four-factor solutions, indicating that the test does not directly map onto Salovey and Mayer's [1] original model of EI. Also, the SSRI is unrelated to important life criteria, including smoking, drug use, alcohol use, and social deviance. Finally, the scale is redundant with existing measures of psychological functioning (e.g., well-being, alexithymia). These findings indicate that the SSRI may not have additional predictive power above and beyond already established measures.

EQ-i

The Emotional Quotient Inventory (EQ-i [5]) is one of the most widely used and studied self-report indices of EI. Indeed, the test has been translated into more than 30 languages [19]. This scale evolved out of the author's question, "Why to some people have better psychological well-being than others? And, why are some people able to succeed in life over others?" [5, p. 1]. The EQ-i contains 133 items and employs a five-point response scale similar to most self-report measures that employ Likert-type scales. The EQ-i measures five constructs that are a composite of specific competencies, including *interpersonal skills* (i.e., self-regard emotional self-awareness, assertiveness, independence, and self-actualization), (b) *interpersonal skills* (i.e., empathy, social responsibility, and interpersonal relationships), (c) *stress-management* (i.e., stress tolerance and impulse control), (d) *adaptability* (i.e., reality-testing, flexibility, and

problem-solving), and (e) *general mood* (i.e., happiness and optimism). However, Bar-On [18] described the general mood factor as a facilitator of EI rather than a part of it. Thus, total EQ-i scores are now computed by summing the first four scales alone. The correlation between these scoring methods is rather high, however ($r = .98$ [20]). Finally, the measure includes validity subscales to tap issues regarding item omission rate, within-subject inconsistency, socially desirable responding, and socially undesirable responding.

Conceptually the EQ-i has the qualities resembling a mixed model of EI (as per [6]). However, while this index includes constructs that pertain to both perceived traits and abilities, the mechanism of measurement does not directly access abilities due to its self-report method. As such, empirically, it may be appropriate to call the EQ-i a trait model as opposed to a *mixed* model (as indices of abilities are filtered through self-reports). Bar-On [19, p. 113] currently refers to the EQ-i as “a self-report measure of emotionally and socially intelligent behavior which provides an estimate of one’s emotional and social intelligence.”

The reliability and validity of the EQ-i have been assessed across several empirical studies (see [19, p. 115] for a summary of the development of this index). Generally, the subscales for the EQ-i have demonstrated strong internal reliability, yielding alpha coefficients that are consistently greater than .90. Further, test-retest coefficients have been reasonable in size across 2-week, 1-month, 2-month, 4-month, and 6-month intervals.

Regarding the validity of the EQ-i, Bar-On [19] has presented data speaking to the factorial, convergent, discriminant, and predictive validity of the test. Separate factor analyses (both exploratory and confirmatory) of the measure have yielded different results, including solutions with 6, 10, 13, and 15 factors [19], [51], calling into question the structural validity of the test.

Much of the information on the convergent/discriminant validity of the EQ-i originally appeared as unpublished data in the technical manual [5]. These reports and some recently published studies have shown that the EQ-i correlates highly with a number of personality measures including anxiety, depression, and alexithymia, as well as the Big Five traits (neuroticism in particular) [20], [52–54]. Independent reviews of the EQ-i [55–56] also have consistently stated that the items on the measure appear to have considerable semantic overlap with the Big Five personality traits. Indeed, empirical investigations suggest that EQ-i may in fact be too strongly intercorrelated with personality traits than is optimal. For example, Brackett and Mayer [20] reported a multiple R of .75 when the Big Five traits were regressed onto the EQ-i total score. In that study, all of the Big Five traits significantly contributed to the prediction of the EQ-i.

Aside from concerns regarding the discriminant validity of the EQ-i, Bar-On [19] has provided evidence regarding the predictive validity of the measure in domains ranging from business/industry to education. For example, the EQ-i has discriminated between successful and unsuccessful Air Force recruiters (Handley, cited in [57]) and academically successful and unsuccessful students ([58], cited in [5]). The positive correlation with academic performance, however, has not been replicated [20], [53]. The EQ-i also appears unrelated to fluid intelligence [5], [59]. Finally, with respect to maladaptive behavior, the EQ-i was predictive of excessive alcohol consumption in one study after controlling for personality and well-being [20].

We have the same concerns about the EQ-i as we did for the SSRI. First, it will be important to determine the best factor structure of the test. Second, future research could benefit from addressing the degree to which EQ-i scores empirically provide unique information separate from data provided by personality trait and well-being measures. The most central concern is that the EQ-i has considerable semantic overlap with measures that have been used for decades. Therefore, future studies must demonstrate that the EQ-i is incrementally valid across multiple outcomes (with multiple control variables).

ECI

The Emotional Competency Inventory (ECI) and its recent descendant, the ECI-2, were developed to address the popular model of EI put forth by Goleman and his collaborators at the Hay Group (see [17], [60]). In addition to being a self-report inventory, this index was explicitly designed to be a 360° measure, meaning that for any given target person, multiple scores are yielded as a result of the target's self-report and the reports provided by relevant observers of the target (e.g., a target's supervisor). Importantly, the ECI was developed in part to assess competencies in work-related contexts. This is evidenced in the authors' definition of EI. According to Boyatzis and Sala an "emotional intelligence competency is an ability to recognize, understand, and use emotional information about oneself or others that leads to or causes effective or superior performance" [17, p. 145].

The ECI-2 as described by Boyatzis and Sala [17] contains 72 items, which cluster into four broad competencies, including: (a) *self-awareness* (i.e., knowing one's internal states, preferences, resources, and intuitions), (b) *self-management* (i.e., managing one's internal states, impulses, and resources), (c) *social awareness* (i.e., handling relationships, awareness of others' feelings, needs and concerns), and (d) *relationship management* (also called social skills; the skill or adeptness at inducing desirable responses in others). Similar to the EQ-i, the ECI was designed to measure 18 specific competencies that are

divided among the four higher order clusters. For example, the self-management cluster is comprised of subscales that tap self-control, trustworthiness, conscientiousness, adaptability, achievement orientation, and initiative. As noted earlier, many of the ECI subscales also assess competencies in work-related contexts. The social skills cluster speaks directly to this point. This cluster includes such competencies as perceived leadership and teamwork ability, the ability to influence others, and inspirational leadership. In an important critique of ECI, Matthews et al. write that "it is difficult not to be cynical of the [ECI], given the lack of publicly accessible data supplied by its creators and the constellation of old concepts packaged under its new label" [3, p. 218].

Since the publication of Matthews et al.'s [3] critique, Boyatzis and Sala [17] have provided information bearing on the psychometric properties of the ECI-2. They have provided data on thousands of workers across multiple organizations to address issues regarding the reliability and validity of this measure. Generally, alpha coefficients suggest relatively strong internal reliability for the informant reports (all but one of the alphas are above .71); however, for the self-assessments, about half of the 18 scales have reliability coefficients below .65. The results from their factor analysis suggest that a general EI factor emerges. However, the overall structural validity of the full-scale ECI is not strongly supported by the authors' factor analysis, which resulted in only nine factors with eigenvalues greater than 1.0. Thus, the degree to which the ECI empirically matches their underlying model of EI (i.e., four clusters that are comprised of 18 competencies) is questionable.

In spite of issues regarding the structural validity of the ECI, Boyatzis and Sala [17] provide some evidence that the ECI has discriminant validity because scores on the scale are not redundant with personality traits such as the Big Five. In one study, the strongest association between any ECI cluster and any of the Big Five traits, for instance, was between self-awareness and extraversion, $r = .47$ ([61], cited in [17]).

The ECI also appears to predict work-related outcomes reasonably well. For example, in a small sample of Turkish finance professionals, ECI scales correlated with salary ($r_s = .30$ – $.43$ across all four clusters). However, the scales did not correlate significantly with position in the company or number of promotions. ECI scores also were correlated positively with several indices of job performance in a sample of firefighters from Britain ([62], cited in [17]). However, in that study, the large correlations between the ECI informant ratings and objective performance ratings (e.g., teamwork and collaboration correlated highly with interpersonal ability), may be due to the conceptual overlap between the measures or to both measures having been completed by the same informants. In addition, Boyatzis and Sala review other interesting validation studies using the ECI, but

many of the studies were conducted with very small sample sizes ($Ns < 30$) [17]. Finally, there is little evidence that the ECI is incrementally valid.

In sum, the ECI shows some promise regarding its ability to predict relevant outcomes in work-related settings. There is a dearth of research, however, on the general psychometric properties of the measure, including its structural and incremental validity. As noted earlier, the ECI was designed to assess 18 competencies that are conceptually organized according to four broad clusters; however, factor analysis of the scale's 72 items indicates that there are nine factors [17]. Moreover, there are no reports of the intercorrelations of these nine factors or the four conceptual clusters. It would be important to know whether the nine factors are themselves hierarchically organized according to four clusters or one overall ECI factor. Future research needs to address these issues to provide empirical support for the latent model that this index was designed to measure.

SREIS

The Self-Rated Emotional Intelligence Scale (SREIS [9]) was designed to measure people's self-reported ability to perceive, use, understand, and manage emotions, the four emotion-related abilities that are assessed by the MSCEIT. The measure was developed for the purposes of directly testing the relationship between people's self-reported beliefs about their emotion-abilities and their actual abilities. For example, do individuals who report having a rich emotions vocabulary actually have this lexicon?

On the SREIS, *emotion perception* is assessed with statements such as, "I am good at reading people's facial expressions." The *use of emotion to facilitate thought* is measured by statements such as, "When making decisions, I listen to my feelings to see if the decision feels right." *Understanding of emotion* is measured by statements including, "I have a rich vocabulary to describe my emotions." Finally, *management of emotion* is measured by statements such as, "I know how to keep calm in difficult or stressful situations."

Brackett et al. [9] addressed the factor structure of the SREIS. In two studies, the structure of the measure was examined using both exploratory (EFA) and confirmatory factor analytic (CFA) techniques. As predicted, the four-factor solution in the EFA was optimal. Moreover, the CFA model, which tested the four-domain solution with two subcomponents in the managing emotions domain (self management and social management), provided a good fit to the data ($NFI = .91$, $TLI = .94$, and $MSEA = .04$). The reliabilities of the four subscales ($\alpha s = .64-.84$) and the SREIS total score ($\alpha = .77$) were not all optimal, but in an acceptable range. Thus, these findings indicate that people's self-rated EI can be

measured with some degree of reliability. Further, the results of CFA suggest that the basic dimensions of EI can be detected with a self-report scale such as the SREIS in addition to a performance-based measure such as the MSCEIT.

Brackett et al. [9] also examined (a) the relationship between the SREIS and the MSCEIT, (b) the discriminant validity of the SREIS, and (c) the incremental validity of the SREIS. As expected, the correlation between the SREIS and MSCEIT total scores were rather low ($r_s < .25$ across three studies). Additional analyses showed that the relationship between self-reported EI and ability EI operates in the same way as other abilities [43]. That is, relative to actual performance, those with lower MSCEIT scores overestimated their EI, whereas those with higher MSCEIT scores underestimated their EI. The discriminant validity of the SREIS in relation to the Big Five personality traits and measures of well-being also was examined. With respect to the Big Five, SREIS scores correlated with all of the five Big Five traits (all $r_s < .42$), except for agreeableness. With respect to measures of well-being, SREIS scores correlated with psychological well-being ($r = .47$) and with life satisfaction ($r = .23$). These results indicate that the relationship between the SREIS and well-studied personality attributes is not as strong as it was for the SSRI and the EQ-i.

Finally, Brackett et al. [9] examined the predictive and incremental validity of the SREIS (compared to the MSCEIT). The MSCEIT, but not the SREIS, was significantly related to self-perceived quality of interpersonal relationships (Study 2) and interpersonal competence in a lab-based social interaction (Study 3) after personality and well-being were held constant.

The results of this research suggest that measuring EI with performance-based tests such as the MSCEIT in contrast to self-report measures such as the SREIS makes it possible to analyze the degree to which emotion-related abilities contribute (independently) to a person's social behavior. Therefore, the utility of the SREIS as a self-report measure of EI is questionable. Future research, however, might examine whether discrepancy scores between self-report and ability measures, which tap the same underlying construct theoretically, predict behavior. For example, what are the implications for individuals who grossly overestimate or underestimate their EI?

Intercorrelations Among Different EI Measures

Research indicates that ability tests of EI such as the MSCEIT do not correlate highly with self-report tests of EI, including the SSRI, EQ-i, or SREIS. For example, in one study, the MSCEIT correlated .21 with the EQ-i and .18

with the SSRI [20]. Even when self-report measures were designed to correspond with ability measures (e.g., MSCEIT and SREIS), the correlations between the measures were quite low [9], as noted above. The relationships among self-report measures of EI tend to be somewhat higher. For example, the correlation between the EQ-i and SSRI was .43 in one study [20] and .66 in another [63]. Ultimately, these findings suggest that self-report and performance tests of EI are empirically distinct.

The weak findings between ability and self-report EI scales can be interpreted in a number of ways. First, self-report and performance measures tap different mental systems (beliefs versus abilities) about the person, which may develop independently. Second, there is, in general, low variance in self-ratings because individuals rarely see themselves as "below average" [64]. Third, even though it seems the individual would be in the best position to make an assessment of his or her own mental ability, researchers are reluctant to use self-report indices because they contain a great deal of unwanted variance, mostly in the form of social desirability and self-deception [42], [65]. Fourth, a person's overall mental capacity also could influence his or her predictions. For example, it is likely individuals with low EI would not be in the position to self-report on their actual EI skills because they lack the metacognitive skills to do so [43]. Finally, the relationship between self-report and performance measures of EI may be especially weak because Western culture presents little opportunity for explicit feedback in this domain. That is, we do not have institutions to teach us about our emotion-related abilities as we do for our intellectual abilities. In school, for example, we receive objective feedback on our academic performance through grades and standardized test scores, which may help us to gauge our intellectual ability. There is no readily available criterion for EI, however, which would make it difficult for individuals to make accurate self-judgments about these skills.

Conclusions Regarding Utility of Different EI Indices

There are now three general ways to assess EI. Performance tests such as the MSCEIT, which are based on Mayer and Salovey's [4] ability model, self-report tests such as the EQ-i and SSRI, which are based on trait- or mixed models of EI (e.g., [5], [19]), and self-report measures such as the SREIS that map onto ability tests [9].

Preliminary findings with the MSCEIT suggest that EI as a mental ability exists as a distinct, clearly defined construct that has evidence of incremental validity. The MSCEIT, however, measures only a select number of

emotion-related abilities. For example, it would be important to test whether facial recognition of emotion as assessed by the MSCEIT correlates with real-time emotion recognition tasks. The factor structure and validity of the MSCEIT (and the other EI measures) also needs to be examined in different cultures. For example, the strategies deemed effective for the management of others' emotions in the United States might not be effective in India or China.

In regard to trait or mixed models, most of the attributes measured by the EQ-i and SRRI overlap substantially with existing constructs, which suggests that these scales have a breadth of coverage that is not very different from well-studied personality and well-being scales. These models and the tests that stem from them also are somewhat misleading because they suggest that there is a new, integrated, single psychological entity called EI that combines diverse traits such as stress tolerance, persistence, and good interpersonal skills. The utility of self-report measures such as the SREIS, which maps onto ability measures, is also questionable. The SREIS did not correlate with objective tests of EI or outcomes of social importance.

□ Conclusion

As we learn more about EI, both the theories and tests will need to be updated. Research on EI is still in its beginning stages and there is much to be learned about its various subcomponents and the best way to assess it. For example, it is unclear how EI abilities develop. That is, how much of EI is genetically based, learned or both? What are the parental and peer influences on the development of emotion skills? It is also unclear whether EI skills can be taught and who will benefit most from such interventions. A number of researchers [66] have developed and are currently testing whether the integration of emotional competencies into standard school curricula such as language arts and history will have an impact on children's socioemotional development. Finally, once the associations are confirmed, it will be necessary to explain the mechanisms by which EI predicts behavior.

What we know thus far suggests that broad definitions (and tests) of EI, which do not refer exclusively to skills associated with the terms *emotion* and *intelligence*, are probably improper uses of the term. When EI is not confined to emotion or intelligence, it is difficult to decide what list of traits, skills, and perceived abilities it encompasses. This is becoming increasingly evident as new models and tests of EI are continuously emerging in the literature. Although the traits covered by mixed or trait-based models such as optimism and stress tolerance, and the self-report scales that the

empirically correlate with such as neuroticism and well-being are all important and predictive of real-life criteria, they are better addressed directly and as distinct from EI. There is a general consensus that performance tests are the gold standard in intelligence research because they measure the actual capacity to perform well at mental tasks, not just one's self-efficacy about certain mental tasks [6], [67]. Keeping the measurement of EI restricted to performance tests makes it possible to develop content valid ability measures and to analyze the degree to which EI skills specifically contribute to a person's behavior [6], [14], [68].

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