

Measuring emotional intelligence with the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT)

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This manuscript examines the measurement instrument developed from the ability model of EI (Mayer and Salovey, 1997), the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer, Salovey and Caruso, 2002). The four-branch model of EI is briefly presented. The paper examines the MSCEIT, its subtests, scoring method, psychometric properties, reliability, and factor structure. Many applied studies used the MSCEIT and showed the discriminant, convergent, predictive, and incremental validity of the test. The instrument shows appropriate discriminant validity from measures of other classic constructs such as cognitive abilities and personality traits. Findings regarding the low correlations of MSCEIT scores with self-reported measures of EI are discussed. Finally, the authors review evidence that demonstrate the incremental validity of the test when predicting important outcomes such as academic performance, cognitive processes, psychological well-being, depression, anxiety, prosocial and maladaptive behavior, and leaderships and organizational behavior. To conclude, the authors encourage several lines of research under their EI model using the MSCEIT.

La medida de la inteligencia emocional con el Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT). Este artículo examina el instrumento de medida desarrollado desde el modelo de habilidad de IE (Mayer y Salovey, 1997), el Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer, Salovey y Caruso, 2002). Brevemente, se presenta el modelo de cuatro ramas de IE. El artículo examina el MSCEIT, sus subescalas, el método de puntuación, las propiedades psicométricas, su fiabilidad y estructura factorial. Varios estudios han utilizado el MSCEIT y han demostrado la validez discriminante, convergente, predictiva e incremental del test. El instrumento muestra una validez discriminante apropiada respecto a otros constructos clásicos como las habilidades cognitivas o los rasgos de personalidad. Además, se justifican las bajas correlaciones encontradas entre las puntuaciones del MSCEIT y las medidas autoinformadas de IE. Finalmente, los autores revisan la evidencia empírica que demuestra la validez incremental del test para predecir resultados importantes como rendimiento académico, procesos cognitivos, bienestar psicológico, depresión, ansiedad, conducta prosocial y conductas no adaptativas, y comportamiento organizacional y de liderazgo. Para concluir, los autores animan a investigar en diferentes líneas siguiendo su modelo de IE utilizando el MSCEIT.

We use the term Emotional Intelligence (EI) to refer to the mental processes involved in the recognition, use, understanding, and management of one's own and others' emotional states to solve problems and regulate behavior (Mayer and Salovey, 1997; Salovey and Mayer, 1990). That is, we view EI as ability- or competency-based (cf. Saarni, 1999), as distinguished from being rooted in personality attributes (see Brackett and Mayer, 2003; Mayer, Salovey and Caruso, 2000 for theoretical and empirical distinctions). Emotional intelligence from this tradition refers to an individual's capacity to reason about emotions and to process emotional information in order to enhance cognitive processes.

In two journal articles in 1990, we formally defined EI and presented a preliminary demonstration of how the construct could be measured as an ability (Mayer, DiPaolo and Salovey, 1990; Salovey and Mayer, 1990). Our initial definition of EI was «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» (Salovey and Mayer, 1990, p. 189). We then refined our thinking about EI and published a four-branch model, which defined EI as the ability to (a) perceive emotion, (b) use emotion to facilitate thought, (c) understand emotions, and (d) manage emotion (Mayer and Salovey, 1997).

This manuscript focuses on the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer, Salovey and Caruso, 2002a), which was designed to measure the four-branch model of EI. Here, we describe the MSCEIT, its psychometric properties, and recent validation studies with the instrument (see also Mayer, Salovey and Caruso, 2002b). Evidence supports the idea that EI (operationalized by the MSCEIT) meets classical criteria of a standard intelligence and predicts outcomes of social importance

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(Mayer, Salovey, Caruso and Sitarenios, 2001, 2003). To acquaint the reader with our theory of EI, we begin with a brief review of the four-branch model. Elsewhere, the theory is described in more detail (Mayer and Salovey, 1997; Salovey, Bedell, Detweiler and Mayer, 2000; Salovey, Mayer and Caruso, 2002).

Four-Branch model of emotional intelligence

Our analyses of emotion-related abilities led us to conceive of EI as comprised of four branches or abilities, as illustrated in table 1. Whereas the perception, understanding, and management of emotions (Branches 1, 3, and 4) involve reasoning about emotions, Branch 2 (the use of emotions to facilitate thought) involves using emotions to enhance reasoning.

Perceiving emotion

The first branch of EI is defined as the ability to perceive and identify emotions in oneself and others, as well as in other stimuli including people's voices, stories, music, and works of art (e.g., Ekman and Friesen, 1975; Nowicki and Mitchell, 1998; Scherer, Banse and Wallbott, 2001). When focused on the self, this dimension is related to greater emotional awareness (Lane, Quinlan, Schwartz, Walker and Zeitlin, 1990), lower alexithymia (Apfel and Sifneos, 1979), and less ambivalence about emotional expressivity (King, 1998; King and Emmons, 1990). When focused on other people, this dimension encompasses what is meant by affect sensitivity (Campbell, Kagan and Krathwohl, 1971), affect-receiving ability (Buck, 1976) and nonverbal sensitivity (Rosenthal, Hall, DiMatteo, Rogers and Archer, 1979).

Use of emotion to facilitate thought

The second branch of EI concerns the ability to use emotions to focus attention and to think more rationally, logically, and creatively. Using emotions may require the ability to harness feelings that assist in certain cognitive enterprises such as reasoning, problem-solving, decision-making, and interpersonal communication. Emotions can create diverse mental sets that prove more and less adaptive for various kinds of reasoning tasks (Isen, 1987; Palfai and Salovey, 1993; Schwarz, 1990; Schwarz and Clore, 1996). For example, some emotions may be more useful in

stimulating creative thought (Isen and Daubman, 1984; Isen, Daubman and Nowicki, 1987) and there may be a feedback loop wherein some people are especially creative in their experiences of emotion (Averill, 1999, 2000; Averill and Nunley, 1992).

Understanding emotion

The third branch of EI, understanding emotions, involves a fair amount of language and propositional thought to reflect the capacity to analyze emotions. It includes an understanding of the emotional lexicon and the manner in which emotions combine, progress, and transition from one to the other. Individuals who are skilled at understanding emotions have a particularly rich feelings vocabulary and appreciate the relationships among terms describing different feeling states. They may be especially sensitive to the manner in which emotion words are arranged as fuzzy sets organized around emotional prototypes (Ortony, Clore and Collins, 1988), and adept at identifying the core meaning or themes behind various emotional experiences (Lazarus, 1991).

Managing emotion

The ability to regulate moods and emotions in oneself and in other people constitutes the fourth branch of EI. When managing one's own feelings, people must be able to monitor, discriminate, and label their feelings accurately, believe that they can improve or otherwise modify these feelings, employ strategies that will alter their feelings, and assess the effectiveness of these strategies. Several investigators have identified clear individual differences in at least some people's perceived self-efficacy with respect to this ability (Catanzaro and Greenwood, 1994; Salovey, Mayer, Goldman, Turvey and Palfai, 1995). Some people are also more or less effective in helping others to manage their emotions. For example, some individuals always know the right thing to say or do to cheer up their best friend, to motivate a colleague at work, or to inspire others, whereas other individuals are less capable of effecting these outcomes (e.g., Wasielewski, 1985).

Measuring emotional intelligence with the MSCEIT

The four EI abilities were first measured with a test called the Multifactor Emotional Intelligence Test (MEIS; Mayer, Caruso

Emotional intelligence	
Branch name	Brief description of skills involved
Perception of emotion (Branch 1)	The ability to perceive emotions in oneself and others, as well as in objects, art, stories, music and other stimuli
Use of emotion to facilitate thinking (Branch 2)	The ability to generate, use, and feel emotion as necessary to communicate feelings, or employ them in other cognitive processes
Understanding of emotion (Branch 3)	The ability to understand emotional information, how emotions combine and progress through relationship transitions and to appreciate such emotional meanings
Management of emotion (Branch 4)	The ability to be open to feelings, to modulate them in oneself and others so as to promote personal understanding and growth

and Salovey, 1999). This instrument was improved upon, leading to a briefer test that was produced professionally, the MSCEIT (Mayer, Salovey and Caruso, 2002a). The items developed for the MEIS served as the starting point for the MSCEIT. However, several iterations took place in the development of the current MSCEIT Version 2.0.

The MSCEIT assesses the four-branch model of EI (perceiving, using, understanding, and regulating emotions) with 141 items that are divided among 8 tasks (two for each branch). The test yields seven scores: one for each of the four branches, two area scores, and a total EI score. The two area scores are termed: Experiential EI (branches 1 and 2 combined), and Strategic EI (branches 3 and 4 combined).

Mayer et al (2001, 2003) assert that the emotional abilities measured by the MSCEIT meet classical criteria for an intelligence because: (a) the MSCEIT has a factor structure congruent with the four branches of the theoretical model; (b) the four abilities show unique variance, but are meaningfully related to other mental abilities such as verbal intelligence; (c) EI develops with age and experience, and finally; (d) the abilities can be objectively measured.

MSCEIT subtests

The first branch of EI, Perceiving Emotions, is measured by asking respondents to identify the emotions expressed in photographs of people's faces (Faces) as well as the feelings suggested by artistic designs and landscapes (Pictures). For example, in the Faces task, participants are presented with a picture of a person expressing a basic emotion. Below the picture is a list of five emotions; the subject is asked to rate on a five-point scale how much of a particular emotion is expressed in the picture.

The second branch 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 non-feeling vocabulary (Sensations), and identify the feelings that might facilitate or interfere with the successful performance of various cognitive and behavioral tasks (Facilitation). For example, the task measuring Sensations presents participants with a sentence asking them to imagine feeling an emotion such as shame. Participants are then given a list of adjectives pertaining to other sensory modalities (e.g., cold, blue, and sweet) and are asked to rate on a five-point scale from «Not Alike» to «Very Much Alike» how much the feeling of shame is similar to the adjectives.

The third branch 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 how they follow upon one another (Changes). For example, a question on the Blends task presents a statement such as «Acceptance, joy, and warmth often combine to form...». Participants are then presented with a list of response alternatives and choose the most appropriate.

The fourth branch of EI, Managing Emotions, has two subtests that assess how participants manage the emotions of others (Social Management), and how a person would regulate his or her own emotions (Emotion Management). For example, the Social Management task asks participants to read a short story about another person, and then determine how effective several different courses of action would be in coping with emotions in the story. Participants rate a number of possible actions ranging from «Very ineffective», to «Very effective».

MSCEIT Scoring

The MSCEIT is an objective 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 5,000 people from various parts of the world) who endorsed each MSCEIT test item. Expert norms were obtained from a sample of twenty-one members of the International Society Research on Emotions (ISRE) who provided their expert judgment on each of the test's items. Many of these individuals have spent their entire careers investigating such phenomena as how emotions are conveyed in facial expressions, emotional language, the phenomenological (conscious) experience of emotion, and emotion regulation.

In consensus scoring, the MSCEIT items are given to a large, heterogeneous sample of individuals. 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., the general public). Response scores are weighted by the proportion of the normative sample who also provided that answer. The assumption is made that large samples of individuals converge on correct answers (Legree, 1995). Norms can also be calculated for certain subgroups, including college students, and business professionals.

Expert scoring relies on properly identified emotions experts to indicate what they believe are the correct answers. Respondents receive credit for correct answers to the extent that they match those of the experts. For example, if .71 of the expert or normative samples says that there is a moderate amount of sadness in a face and a person chooses that answer (i.e., also indicates that the particular stimulus includes a moderate amount of sadness), that person's score is incremented by .71.

We have examined the correlations among EI scores based on the two scoring methods expecting that they may produce convergent but also somewhat distinct findings. Among the more than 5,000 individuals who have taken the MSCEIT, full-scale MSCEIT scores based on the consensus norms and expert norms correlate quite highly, $r = .91$ (Mayer et al, 2003). Generally, correlations with external criteria are replicated across the two scoring methods as well. For example, in one study both expert and consensus scores on the MSCEIT predicted outcomes of social importance, including illegal drug use and social deviance (Brackett and Mayer, 2003).

Psychometric properties of the MSCEIT

Concerns about the psychometric properties of earlier EI tests were raised by Davies, Stankov and Roberts (1998) and were recently repeated by Roberts, Zeidner, and Matthews (2001). The MSCEIT, however, is reliable at the full-scale level and at the area and branch levels (Mayer et al, 2003). The test also has a factor structure congruent with the four-branch model.

Reliability

The MSCEIT branch scores draw on different tasks that include different item forms. For example, perception of emotion (Branch 1), as discussed earlier, is measured by asking respondents to identify the emotions expressed in photographs of faces and artistic designs or landscapes. Under these conditions,

split-half reliability coefficients are used to test reliability, as they involve the orderly allocation of different item types to the two different halves of the test (Nunnally, 1978). Because the MSCEIT is scored using both general consensus and expert criteria, split-half reliabilities can also be computed for each scoring method.

In a recent study using a large portion of the MSCEIT standardization sample (approximately 2000 individuals), Mayer et al (2003) reported full-test split-half reliabilities of .93 and .91 for consensus and expert scoring, respectively. The two area scores' (Experiential and Strategic EI) reliabilities were .90 and .90 for consensus scoring, and .88 and .86 for expert scoring. The reliabilities of the four branch scores (perceiving, using, understanding, and managing emotions) for both methods of scoring were between .76 to .91 (see Mayer et al, 2003, table 1). The reliabilities of the individual tasks, which the test authors do not recommend using, ranged from .55 to .88. Finally, the test-retest reliability of the full-test MSCEIT over a three-week interval was $r(59) = .86$ in a college student sample (Brackett and Mayer, 2003).

Factor structure

The factor structure of a test indicates the number of discrete entities it plausibly measures. In the case of the MSCEIT, it indicates how many dimensions of EI the test is «picking up» – one unified dimension, two dimensions corresponding to the two areas, four dimensions corresponding to the four-branch theoretical model, or something else. Using a large portion of the standardization sample, Mayer et al (2003) performed confirmatory factor analysis on the eight tasks measured by the MSCEIT. They specifically tested for a one, two, and four factor model to examine the range of permissible factor structures.

Mayer et al (2003) reported a progressively better fit of models leading down from the one factor to the four factor solutions. Importantly, all models fit fairly well (see table 2). 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) using consensus and expert scoring methods, respectively.

Validation studies with the MSCEIT

We now have evidence that EI can be measured reliably as an ability and that the MSCEIT is both content and structurally valid.

But is EI discriminable from well-established constructs? Does it predict important outcomes? Although research with the MSCEIT is still in its beginning stages, a number of studies have shown that the test has discriminant, convergent, predictive, and incremental validity. Here, we review some of the most recent studies that have employed the MSCEIT.

Discriminant and convergent validity

The MSCEIT appears to show appropriate discriminant validity from measures of analytic intelligence and many personality constructs. In one study with 330 college students (Brackett, Mayer and Warner, 2003), MSCEIT area and total scores were only modestly correlated with Verbal SAT scores ($r = .23$ to $.39$), a proxy for verbal intelligence. In another study, verbal intelligence, as assessed by the WAIS-III vocabulary subscale and Verbal SAT scores correlated modestly with the Understanding Emotions branch of the MSCEIT (which relies on knowledge of emotional vocabulary), but not with any of the other branches or with the total score (Lopes, Salovey and Straus, 2003). Finally, David (2002) reported correlations of .30 and .44 between the Wonderlic Personnel Test and MSCEIT total scores and Branch 3 scores (Understanding Emotions), respectively.

With respect to Big Five traits, MSCEIT scores were not significantly related to Neuroticism, Extraversion, and Conscientiousness and they were only moderately associated with Agreeableness and Intellect ($r < .28$) in a study conducted by Brackett and Mayer (2003). Lopes et al (2003) reported similar correlations between the MSCEIT and Big Five traits. These researchers also found that MSCEIT scores were not associated with social desirability or mood, or with personality scales such as public and private self-consciousness, and self-esteem.

Finally, as expected, MSCEIT scores are not highly correlated with self-reported measures of EI such as the Bar-On EQ-i (Bar-On, 1997) and the Self-Report EI test (Schutte et al, 1998). In one study, correlations with these two measures were .21 and .18, respectively (Brackett and Mayer, 2003). There are also relatively weak associations between total MSCEIT scores and self-report measures of the meta-mood experience (the way individuals reflect on their moods), which are sometimes considered indices of self-perceived EI, $r = .01$ to $.15$ (Lopes et al, 2003) and $r = .29$ (Gohm and Glore, 2002).

Table 2
The four-branches of emotional intelligence measured by the MSCEIT

Emotional Intelligence Measured by the MSCEIT			
Branch 1: (Perception of emotion)	Branch 2: (Use of emotion to facilitate thinking)	Branch 3: (Understanding of emotion)	Branch 4: (Management of emotion)
<i>Task 1: Faces</i> Participants view photographs of faces and identify the emotions in them	<i>Task 3: Sensation</i> Which tactile, taste, and color sensations are reminiscent of a specific emotion?	<i>Task 5: Blends</i> Which emotions might blend together to form a more complex feeling?	<i>Task 7: Emotion management</i> How effective alternative actions would be in achieving a certain outcome, in emotion-laden situations where individuals must regulate their feelings
<i>Task 2: Pictures</i> Participants view photographs of faces and artistic representations and identify the emotions in them	<i>Task 4: Facilitation</i> How moods enhance thinking, reasoning and other cognitive processes	<i>Task 6: Changes</i> How emotions progress and change from one state to another	<i>Task 8: Relationship management</i> Test-takers evaluate how effective different actions would be in achieving an emotion-laden outcome involving other people

Predictive and incremental validity

Because the MSCEIT was published only recently, there are few completed studies in which the test has been used to predict outcomes in the laboratory, workplace, home, or school. Here, we review some of the most recent work in the area.

Academic performance

The relation between EI and school grades is indeterminate. A few studies have reported zero-order correlations between the MSCEIT and grades in the .20 to .25 range among college students (Barchard, 2003; Brackett and Mayer, 2003). Most of these correlations, however, drop to non-significance once general intelligence (e.g., verbal SAT) is statistically controlled for.

Cognitive processes

In a neuropsychological study, Jauovec, Jauovec, and Gerli (2001) found that those individuals who scored high on EI, as measured by the MSCEIT, required less cognitive effort to solve problems, as measured by patterns in theta and alpha frequency bands of electroencephalographic activity of the brain.

Psychological well-being, depression and anxiety

MSCEIT scores are correlated with scales of psychological well-being (Brackett and Mayer, 2003). Ryff's (1989) scales tap into Autonomy, Mastery, Personal Growth, Positive Relations with Others, Purpose in Life, and Self-Acceptance. MSCEIT total scores correlated with five of the six dimensions (all but Autonomy). The highest correlations were with the Personal Growth and Positive Relations with Others scales ($r_s = .36, .27$, respectively).

Emotional intelligence, as measured by the MSCEIT, is also associated with depressive symptoms and anxiety. Head (2002), for instance, reported significant correlations between the managing emotions subscale of the MSCEIT and measures of depression, such as the Beck Depression Inventory ($r = -.33$), and trait anxiety, on the State-Trait Anxiety Inventory ($r = -.29$). Similarly, in a large community sample in Australia, MSCEIT branch and total scores were negatively associated with depression and anxiety ($r_s = -.25$ to $-.31$), as measured by the Diagnostic Inventory of Depression and State-Trait Anxiety Inventory, respectively (David, 2002).

Prosocial and maladaptive behavior

In several studies with college students, EI was associated with various indicators of positive social relations, even after personality and traditional intelligence were statistically controlled. For example, Lopes et al (2003) reported a significant positive correlation between the managing emotions subscale of the MSCEIT and global self-perceived quality of interpersonal relationships. In that study, MSCEIT scores were also associated with more supportive relationships with parents and less antagonistic and conflictual relationships with a close friend. Another study examined college students' interactions on a 10-week group project at the University of Toronto (Côté, Lopes and Salovey, 2003). Students with high scores on the managing emotions subscale of the MSCEIT were more satisfied with other

group members, with the quality of the communication within the group, and with the social support they received from their peers.

Managing Emotions (MSCEIT Branch 4) was associated with the quality of social interactions in two studies (Lopes, Brackett, Nezlek, Schütz, Sellin and Salovey, 2004). Specifically, in a sample of 118 American college students (Study 1), higher managing emotions scores were positively related to the quality of interactions (e.g., more emotional support and less conflict) with friends, evaluated separately by participants and two friends. In a diary study of social interaction with 103 German college students (Study 2), managing emotions scores were positively related to the perceived quality of interactions with opposite-sex individuals. Scores on this subscale were also positively related to perceived success in impression management in social interactions with individuals of the opposite sex. In both studies, the main findings remained statistically significant after controlling for Big Five personality traits.

Brackett et al (2003) measured the quality of interpersonal relationships by asking people to report the number of times they engaged in positive and negative behaviors with best friends, significant others, and parents. Positive relations were assessed with questions pertaining to behaviors such as having long conversations with friends and displaying affection with significant others. Negative interactions were assessed with questions pertaining to behaviors such as getting screamed at by a parent or drinking alcohol heavily with a friend. Self-reported use of illegal drugs (e.g., number of times smoked marijuana and/or used cocaine), alcohol consumption (e.g., most amount of beer drank in one evening, number of times fallen asleep because of intoxication), and violent/mischievous behavior (number of fights in the last month, number of times arrested in the last year) were also assessed. Results of the correlational analyses showed that lower EI in males, principally the inability to perceive and use emotions (Branches 1 and 2), was associated with negative outcomes, including illegal drug and alcohol use, deviant behavior, and poor relations with friends. The findings remained significant even after scores on the Big Five and academic achievement were held constant. The significant correlation coefficients ranged between $r = -.28$ to $-.45$.

It is worth mentioning that a number of the aforementioned studies replicated earlier findings with the MEIS (precursor test to the MSCEIT). For example, Brackett et al.'s (2003) findings with drug use, alcohol consumption, and social deviance, replicated and extended an earlier study with comparable outcome variables (Formica, 1998). Children with higher MEIS (Youth Version) scores were also rated as being less aggressive by their peers and as more prosocial by teachers than those students with lower scores (Rubin, 1999). Finally, in one study with adolescents in California, MEIS scores were negatively associated with tobacco use (Trinidad and Johnson, 2001). Therefore, across EI measurement tools, consistent patterns of negative correlations between EI and problem behavior are emerging.

Leaderships and organizational behavior

Preliminary findings with the MSCEIT across organizational settings suggest that EI positively contributes to some, but not all aspects of job performance.

In one study, male and female group members ($N = 40$ groups) took the MSCEIT and were rated by peers on vision formulation

and articulation after a 10-week project (Coté, Lopes and Salovey, 2003). These researchers found that individuals with higher scores on the MSCEIT exhibited better vision formulation and articulation ($r = .23$). The effect was independent of the Big Five personality traits.

Another study tested 176 currently or recently employed undergraduates on the MSCEIT, and then surveyed their employers to assess their on-the-job performance (Janovics and Christiansen, 2002). Analyses with the 78 surveys that were returned by employers showed that MSCEIT total scores significantly predicted supervisor-rated job performance ($r = .22$). The finding was unchanged when cognitive intelligence was controlled for statistically.

Hypothesizing that the EI of a supervisor would have an impact on his or her immediate subordinates, supervisor MSCEIT scores were correlated with subordinate reports of organizational commitment (Giles, 2001). Using two small samples of managers (13 each from a public and private organization) along with 108 subordinates, Giles found a positive relationship between supervisory Managing Emotions (Branch 4) scores (in one organization) and Understanding Emotions (Branch 3) scores (in the other) on the MSCEIT, and subordinate perceptions.

Two studies, however, resulted in mixed, and perhaps unexpected findings with the MSCEIT in organizational settings. Managing Emotions (Branch 4) scores on the MSCEIT were significantly lower for the highest ranked and highest paid among 59 senior executives in a large international production and service organization (Collins, 2001). The second study, which used the MEIS, investigated the EI of teams of claims adjusters (11 leaders, 26 teams; 164 individuals). The average EI of the team predicted customer satisfaction ($r = .46$), but was otherwise unrelated to productivity or commitment to improvement (Rice, 1999).

These studies suggest that EI contributes to some, but not all aspects of job performance. It should also be noted that the sample sizes for some of the above studies in organizational settings were rather small, and the results should be interpreted as preliminary rather than confirmatory.

Development of EI

Marsland and Likavec (2003) examined a sample of 67 Caucasian mothers and their children. These researchers assessed mother's EI (with 4 of the 8 parallel tasks on the MSCEIT due to time limits) and infant attachment. They also obtained mothers' ratings of the children's socio-emotional competence on an extensive rating scale of child behavior. Maternal EI, especially accurate emotional perception, was highly related to child empathy, prosocial peer relations and relatedness. Mother's EI also correlated with objective classifications of infant attachment status, with higher maternal EI among those with securely attached infants.

Future directions

In this manuscript, we reviewed evidence that EI can be measured reliably with the MSCEIT, that the test is both content and structurally valid, that it shows discriminant validity in relation to other cognitive abilities and personality traits, and has incremental validity when predicting outcomes that are important for the individual and society. We believe these findings lend

support to a broader view of intelligence - one that goes beyond a monolithic 'g' and examines other, emotion-related abilities that have important implications for people's lives (cf. Gardner, 1983).

Research on EI is still in an early stage, and many questions have yet to be addressed. We believe it is time for researchers to seek a deeper understanding of EI. In particular, we think it is necessary to (a) examine how EI develops by first expanding EI measurement to younger age groups, (b) assess whether teaching EI skills has an impact on behavioral outcomes and might change EI itself, (c) continue work on the predictive and incremental validity of EI with respect to important behavioral outcomes at home, school, and the workplace, and finally, (d) begin to examine the processes underlying EI.

Several questions regarding the ontogeny of EI need to be addressed in future research. For instance, we are unclear as to extent to which EI is genetically based, learned, or both. To the extent that it is learned, EI may be influenced by parental behaviors such as emotion coaching and emotion dismissing (Gottman, Katz and Hooven, 1997). Furthermore, why do females typically score higher in EI than males (e.g., Brackett et al, 2003; Mayer et al, 1999)? Women are better able than men to read tacit social information, including feelings from facial expressions and other nonverbal clues (e.g., Hall, 1978, 1984; Rosenthal, Hall, DiMatteo, Rogers and Archer, 1979). But why are there also gender differences in the use, understanding, and management of emotion? Perhaps women develop higher EI because of early child-parent interactions. Mothers not only speak more to daughters than to their sons about feelings, but mothers also display a wider range of feelings to their daughters (Brody, 1985). It may also be that areas of the brain related to emotional processing are better developed in women than men (Gur, Gunning-Dixon, Bilker and Gur, 2002). Only carefully designed longitudinal studies and experiments will help us to understand the observed group differences in adult males and females.

To what extent can EI be taught? It is unlikely that superficial training programs can boost EI substantially because emotional skills reflect a lifetime of learning (Lopes and Salovey, 2004). However, if traditional schooling increases cognitive abilities (Gustafsson, 2001), it might be possible that educational programs focusing on social and emotional abilities stimulate EI. In fact, it appears that infusing emotional literacy programs into existing school curricula can help increase emotional knowledge and work against the initiation and progression of harmful behaviors such as excessive alcohol consumption, illegal drug use, and deviant behavior (Bruene-Butler, Hampson, Elías, Clabby and Schuyler, 1997; Elías, Gara, Schuyler, Branden-Muller and Sayette, 1991; Hawkins, Catalano, Kosterman, Abbott and Hill, 1999). Most current EI intervention programs, however, are not specifically designed to improve components of ability EI and lack both internal and external validity (Zeidner, Roberts and Matthews, 2002). Only well designed curricula and carefully planned intervention studies can show whether EI can be raised, and whether training in EI competencies will discourage problem behavior, encourage prosocial behavior, and improve academic performance.

Future research might also examine the unique contribution of each branch of EI in the prediction of behavior. For example, there is reason to believe that a person's ability to use emotions to facilitate thought (Branch 2) might help trigger behaviors in which the person has the highest likelihood of success. Thus, experimental research employing mood induction could assess whether individuals higher

on EI are better able to direct their behavior into productive tasks.

We also think some of the most interesting research focuses on the processes by which EI affects behavior. For example, we know that EI correlates with positive social relationships (e.g., Brackett et al, 2003; Lopes et al, 2003), but what are the processes through which EI operates in interpersonal relationships, and what specific social contexts or situations are these emotional abilities likely to play important roles? We also have some preliminary data showing that couples who are both low in EI report more conflict and less happiness in their dating relationship (Brackett, Warner and Bosco, 2005). But what is happening between the low EI couple that results in their unhappiness and conflict?

Finally, emotionally intelligent people can manage their emotions more effectively and, consequently, they should be able to cope better with life's challenges. Thus, research is needed to understand whether people high in EI select the most appropriate coping strategies for different types of situations. For example, when faced with a negative life event that has an immediate impact (e.g., loss of a job), will the person higher in EI recognize the importance of using emotion-oriented coping strategies and successfully regulate his or her emotions? Furthermore, now that we know the negative relation between EI and depression and anxiety, clinicians might also investigate whether lower EI is a risk factor for mental illness.

Conclusion

The research reviewed and discussed in this chapter suggests that EI, defined and operationalized as a mental ability with the

MSCEIT, can be reliably measured and predict important psychological and behavioral outcomes (e.g., depression and peer reports of relationships satisfaction). The studies thus far, however, are preliminary, and much more research is needed to test the validity of the MSCEIT. Although the ability model of EI has been around for more than a dozen years (and was anticipated decades earlier by work on social intelligence), the MSCEIT was introduced fairly recently. Evidence for the validity of the MSCEIT will accrue over multiple studies with diverse samples and a variety of theoretically related criteria. The most widely used IQ scales, the Weschler Intelligence scales, are the product of almost a full century of assessment and research. We believe there is much to be learned about EI, and tests such as the MSCEIT will probably be updated as we learn more about the construct. What we know thus far is encouraging, and we are confident that future research will reveal more about how individuals with higher (and lower) EI handle situations in which emotions play important roles, and differ in the other life domains, including mental and physical health, leisure interests, and career choice.

Authors note

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