
Measuring Emotional Intelligence in Early Adolescence With the MSCEIT-YV: Psychometric Properties and Relationship With Academic Performance and Psychosocial Functioning

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Abstract

Emotional intelligence (EI) theory provides a framework to study the role of emotion skills in social, personal, and academic functioning. Reporting data validating the importance of EI among youth have been limited due to a dearth of measurement instruments. In two studies, the authors examined the reliability and validity of the Mayer–Salovey–Caruso Emotional Intelligence Test—Youth Version (MSCEIT-YV), a performance test of EI. Study 1 examined psychometric attributes of the MSCEIT-YV in a large sample of fifth- to eighth-grade students ($N = 756$). Study 2 examined the relationship of the MSCEIT to student and teacher reports of academic, social, and personal functioning among fifth- and sixth-grade students ($N = 273$). The authors report that EI can be measured reliably with the MSCEIT-YV and that higher scores on the test are related to healthier psychological functioning and greater social competence based on both teacher and student ratings, as well as to academic performance in English language arts.

Keywords

Mayer-Salovey-Caruso Emotional Intelligence Test; emotional intelligence; emotion skills; early adolescence

When children and youth are emotionally competent at home and in school, they are more likely to develop into healthy, effective, productive, and caring adults (Raver, 2002; Zigler & Bishop-Josef, 2006; Zins, Weissberg, Wang, & Walberg, 2004). Skills associated with processing and responding to emotions include recognizing the expression of emotions in others, using emotions

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to enhance thinking, and regulating emotions to drive effective behaviors (Salovey & Mayer, 1990). These skills are associated with social competence, adaptation, and academic success (reviewed by Mayer, Roberts, & Barsade, 2008). For example, youth with strong abilities to recognize and understand emotions, label emotions accurately, and manage the intensity, frequency, and type of emotions experienced are more likely than others to be psychologically healthy, socially adept, and better students in school (Denham, 1998; Fine, Izard, Mostow, Trentacosta, & Ackerman, 2003; Saarni, 1999). Children with poorly developed emotion skills, in contrast, are more prone to poor psychosocial functioning, including depression, anxiety, violence, drug and alcohol use, destructive relationships, and lower academic achievement (Eisenberg, Fabes, Guthrie, & Reiser, 2000; Feldman, Philippot, & Custrini, 1991; Halberstadt, Denham, & Dunsmore, 2001; Kindlon & Thompson, 2000; Rivers, Brackett, Salovey, & Mayer, 2007; Saarni, 1999).

Psychologists and educators agree that emotions are adaptive only when the information they provide is attended to, interpreted, understood, used, and managed effectively (Denham, 1998; Mayer & Salovey, 1997; Saarni, 1999). Emotions are a multifaceted, integrated response occurring within an individual in reaction to a change (real or imagined) in the environment, such as a loud noise, positive or negative news, a reunion with a loved one, or the discovery of a lost toy.

During an emotional response, the cognitive, physiological, and behavioral systems are engaged, at various levels, in order to prepare the individual to adapt to the change (e.g., Darwin, 1872/1999; Frijda, 1986; Plutchik, 1980). Cognition alters how and what children attend to at home and in the classroom, physiology regulates the amount of energy children have, and behavior is modified in regard to how children express themselves and regulate their actions. These changes often can be adaptive and help individuals to respond to the events that caused the emotion in the first place (Lazarus, 1991). Emotions also serve an informative function (Ekman, 1973; Keltner & Haidt, 2001). The expression of emotion conveys information about thoughts, intentions, and behavior. Consequently, the ability of youth to integrate emotional information into their thinking can contribute broadly to their socioemotional functioning (e.g., Denham, 1998; Eisenberg et al., 1995; Saarni, 1999).

Given the increasing evidence supporting the importance of emotion skills, researchers, psychologists, and educators alike are looking for ways to measure these skills in youth. With the advent of social and emotional learning initiatives that set out to increase competencies in these areas, a way to assess emotion skills is in high demand (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). Several instruments exist that measure single skills, such as the perception of emotion (Nowicki & Duke, 2001) or understanding of emotion among children (Izard, Trentacosta, King, & Mostow, 2004). Until recently, however, there has been no omnibus assessment tool for measuring a set of emotion skills among adolescents. With the introduction of emotional intelligence (EI) theory (Mayer & Salovey, 1997; Salovey & Mayer, 1990) more than two decades ago, and associated measurement instruments, the utility of assessing inter-related emotion skills has become more apparent (Mayer, Salovey, & Caruso, 2008; Mayer, Salovey, Caruso, & Sitarenios, 2003). The purpose of this article is to present preliminary evidence for the reliability and validity of a new assessment tool for measuring emotion skills among adolescents.

EI Theory and Measurement

EI refers to the capacity to both reason about emotions and use emotion to enhance thinking and problem solving. According to EI theory, these abilities promote well-being and facilitate social functioning (Mayer & Salovey, 1997; Salovey & Mayer, 1990). EI theory delineates four relatively distinct emotion abilities: perceiving, using, understanding, and managing emotion,

representing what is referred to as the Four Branch Ability Model of EI (Mayer & Salovey, 1997). This ability conceptualization of EI is different from others that construe EI as a diverse group of socioemotional traits and abilities (e.g., Bar-On & Parker, 2000; Goleman, 1995; Petrides & Furnham, 2001; Wong, Law, & Wong, 2004). Thorough reviews of the distinctions between the models are available (e.g., Brackett & Geher, 2006; Matthews, Zeidner, & Roberts, 2002; Mayer, Salovey, & Caruso, 2008).

The ability model of EI specifies that the four abilities constituting EI have developmental trajectories, such that emotion skills within each ability area evolve from basic to more advanced and complex (Mayer & Salovey, 1997; Salovey & Mayer, 1990). According to EI theory, over the course of development, individuals mature in their capacity for processing and applying emotional information within each ability area across contexts (at home, with friends, at school or work, etc.). Here, we present an overview of the four abilities and provide examples of the associations of each with important outcomes for youth (for more detailed descriptions of the abilities, see Mayer & Salovey, 1997).

EI Skill Areas

Perceiving and expressing emotion. This skill area involves identifying and differentiating emotions in one's own bodily states, feelings, thoughts, and expressions, as well as in those of other people, and in cultural expressions such as art, music, and architecture. Expressing emotion refers to the communication of feelings, including the appropriate ways and times to express them as determined by various display rules. Youth who recognize the emotional cues expressed by peers, teachers, and parents can modify their own behavior and respond in ways that are socially appropriate and helpful in achieving goals (Denham et al., 2003; Ekman, 2003). Youth who have difficulty perceiving their own emotions and expressing them to others often are socially disconnected (Izard, 1989). Thus, the ability to perceive one's emotional experiences and communicate them appropriately contributes to social competence as well as to psychological well-being and health (Feldman et al., 1991).

Using emotion to facilitate thought. This ability refers to the use of emotion both to focus attention and to think more rationally, logically, and creatively. It involves harnessing emotions to prioritize thinking and guide attention. Different emotional states modify thinking, such that certain emotions are more and less adaptive for various kinds of reasoning tasks (Isen, 1987; Palfai & Salovey, 1993; Schwarz, 1990; Schwarz & Clore, 1996). For example, positive emotions are more useful in stimulating creative thought (Fredrickson, 1998; Isen & Daubman, 1984; Isen, Daubman, & Nowicki, 1987; Jamison, 2004), and somewhat negative moods are more conducive to solving deductive reasoning tasks (Palfai & Salovey, 1993). Generating vivid emotions to aid judgment and memory processes and initiating moods to facilitate both consideration of multiple perspectives and different thinking styles (e.g., inductive vs. deductive reasoning) reflects more advanced "using emotion" ability.

Understanding emotion. This ability involves knowing the causes of emotions, what emotions signify about goals and well-being (Stein & Levine, 1999), and how to label emotion accurately, which involves making connections between the experience of and the lexicon of emotion (Clore, Ortony, & Foss, 1988). Youth with a deeper understanding of emotion are better able to use effective problem-solving strategies to cope with negative and positive events (Greenberg, Kusche, & Riggs, 2004) and to interpret situations from others' perspectives and develop empathy (Denham, 1998). When youth can differentiate among and label their distinct emotional states, they can communicate effectively with others, reducing misunderstanding in social interactions. Indeed, youth who can label emotions properly have more positive social interactions, whereas youth with deficits in labeling also display behavioral and learning problems (Izard et al., 2001).

Regulating emotion. This ability refers to managing the thoughts, feelings, and behaviors that occur with an emotional experience (Denham, 1998; Eisenberg et al., 2000). The intensity of terror may be reduced to apprehension, enthusiasm may be prolonged until a project is completed, fear may be replaced by “mustering up” courage, and the experience of regret may be transformed to self-forgiveness. Youth who regulate emotions well are able to feel the full range of positive and negative emotions genuinely, share those emotions with others, and incorporate coping strategies effectively when faced with life’s challenges (Mayer & Salovey, 1997). Youth who self-regulate optimally use emotions as cues for how to act and manage behavior in maintaining relationships (Saarni, 1999) and succeeding in school (Lopes & Salovey, 2004).

Measuring EI

Research on adults provides empirical support that EI exists and can be measured with performance-based assessments that rely on directly assessed knowledge and skills (as opposed to self-reported judgments; Mayer, Salovey, & Caruso, 2008). One such performance-based assessment is the MSCEIT (Mayer, Salovey, & Caruso, 2002a, 2002b; Mayer et al., 2003). On the MSCEIT, individuals complete sets of tasks that require test-takers, for example, to label an emotion that is expressed on a face or in an image, identify the most effective strategy for regulating an emotion in interpersonal situations, and select the emotion that is most effective for completing a specific task (e.g., planning a party or giving feedback on a paper).

The ability model of EI specifies that the construct reflects a capacity to use emotions in thinking, planning, and decision making. Assessments that ask respondents how good they are at recognizing their emotions and those of others or how effectively they regulate anger are prone to response biases such as social desirability. Thus, performance tests and not self-report indices are a more appropriate measurement tool. Most people make inaccurate self-judgments about their intellectual capacities, either over- or under-estimating their ability and performance on more objective assessments (Alicke, 1985; Dunning, Johnson, Ehrlinger, & Kruger, 2003; Mabe & West, 1982). Correlations between self-reported and actual verbal intelligence tend to be below .30 (Brackett, Rivers, Shiffman, Lerner, & Salovey, 2006; Paulhus, Lysy, & Yik, 1998). Similarly, correlations between self-reported and actual EI are low (Brackett et al., 2006). A 13-study meta-analysis with a combined sample size of 2,442 reported an overall correlation of .14 between MSCEIT scores and various self-report measures (Van Rooy & Viswesvaran, 2004). Moreover, unlike the MSCEIT, self-report indices of EI tend to overlap significantly with measures of personality traits and subjective well-being (Brackett & Mayer, 2003; O’Connor & Little, 2003). Finally, MSCEIT scores are not associated with social desirability (Lopes, Salovey, & Straus, 2003) and presumably cannot be faked, which is a problem with other self-report scales (Grubb & McDaniel, 2007). Thus, as with verbal or quantitative intelligence, ability scales are the standard for measuring EI.

MSCEIT scores are associated with academic success in both high school and college students (Brackett & Mayer, 2003; Márquez, Martín, & Brackett, 2006). Scores on the test also are related to other intelligence measures, such as verbal SAT scores (Brackett, Mayer, & Warner, 2004), and the amount of cognitive effort involved in solving emotion-laden social problems, as assessed by patterns in theta and alpha frequency bands of electroencephalographic activity of the brain (Jausovec, Jausovec, & Gerlic, 2001) and activity in the frontal lobe of the brain during social problem-solving tasks (Reis et al., 2007).

MSCEIT scores correlate with social functioning, psychological well-being, lower psychopathology, and better leadership in the workplace (reviewed by Mayer, Roberts, & Bersade, 2008; Mayer, Salovey, & Caruso, 2008). For example, low MSCEIT scores are related to higher levels of depression (Hertel, Schutz, & Lammers, 2009), anxiety (O’Connor & Little, 2003),

and schizophrenic symptoms (Kee et al., 2009). Low scores on the test also are related to more risk-taking behavior such as using drugs, drinking alcohol, and smoking cigarettes (e.g., Brackett et al., 2004; Trinidad & Johnson, 2002). Higher MSCEIT scores on the other hand are related to well-being (Brackett & Mayer, 2003; Lopes, Grewal, Kadis, Gall, & Salovey, 2006), social competence, quality relationships, and interpersonal sensitivity (Brackett et al., 2006; Brackett, Warner, & Bosco, 2005; Lopes et al., 2004; Lopes, Salovey, Cote, & Beers, 2005; Lopes et al., 2003). Higher scores on the test also are correlated positively with on-the-job merit increases and positive evaluations from peers and supervisors (Lopes et al., 2003), as well as with greater job satisfaction and lower burnout (Brackett, Palomera, Mojsa-Kaja, Reyes, & Salovey, 2010).

The MSCEIT is not without limitations (see Matthews, Roberts, & Zeidner, 2004; Rivers, Brackett, & Salovey, 2008). For example, the test was designed to be administered easily using either paper-and-pencil or online versions; however, this approach does not allow for the direct assessment of certain emotion skills such as the ability to regulate emotions in real time, making the test more closely related to crystallized rather than fluid intelligence (Farrelly & Austin, 2007). Although research supports the four-factor model (e.g., Mayer et al., 2003), other research shows a better fit for a three-factor model, usually without a separate facilitating emotions factor (e.g., Gignac, 2005; Maul, 2011; Palmer, Gignac, Manocha, & Stough, 2005). Certain dimensions on the test, like the perception of emotion, assess that particular ability with a limited set of items. In turn, these dimensions fail to capture other communication channels, including gesture, voice, or posture (O'Sullivan & Ekman, 2004), and show poor convergence with other measures of nonverbal emotional perception (Roberts et al., 2006). Nevertheless, findings indicate that the MSCEIT measures something distinct from personality assessments and predicts important life outcomes above and beyond such measures (Brackett et al., 2004; Grewal & Salovey, 2005; Mayer, Salovey & Caruso, 2008).

The purpose of the present research is to extend what we know about EI in adults to youth. Two studies were conducted using the MSCEIT-Youth Version (MSCEIT-YV; Mayer, Salovey, & Caruso, in press), an EI performance test for youth. Study 1 examined the reliability and factor structure of the MSCEIT-YV among fifth- to eighth-grade students who ranged in age from 10 to 13 years. Study 2 used a portion of the sample that took additional criterion measures. Here, we examined the relationship of EI to psychosocial functioning using both self- and teacher-reports of social and emotional competence using the Behavior Assessment System for Children (Reynolds & Kamphaus, 1992), as well as to academic performance.

Study 1

The purpose of Study 1 is to examine the structure of the MSCEIT-YV and test the fit of a higher-order model, as specified by EI theory, with scores on the four subsections of the test (perceiving tasks, using tasks, understanding tasks, and managing tasks) loaded on the higher-order factor (total EI). We used confirmatory factor analysis (CFA) to test the model fit.

Method

Sample. The sample included 775 fifth- through eighth-grade students (49.8% boys, 47.9% girls, and 2.3% missing) from two public school districts in the Northeastern United States. Students ranged in age from 9 to 15 years. One purpose of the analyses was to examine age trajectories of scores on the MSCEIT-YV. Accordingly, we removed students who were aged 9 years ($n = 10$), 14 ($n = 7$), or 15 ($n = 2$) from the data set because there were not enough cases for the analyses. The final sample included 756 students (49.6% boys, 48.0% girls, and 2.4% missing

Table 1. Mayer and Salovey's Emotional Intelligence Model as Measured by the MSCEIT-YV

Brief Definition	MSCEIT-YV Tasks	Total Number of Task Sets (or Parcels) and Total Number of Items
EI ability area		
Perceiving and expressing emotions		
Recognizing accurately the expression of emotion in the self and others	Rating the emotions expressed on faces	8 sets, 32 items
Using emotions		
Using emotions to facilitate thinking and decision making	Describing emotions using texture, color, and energy terms	6 sets, 24 items
Understanding emotions		
Knowing the causes and consequences of emotion	Selecting the best emotion term to suit an emotional description, cause, or consequence	3 sets, 23 items
Regulating emotions		
Managing the experience and expression of emotion to promote personal growth and goal achievement	Reading a vignette about an emotionally laden situation and rating the effectiveness of different behaviors to modify the emotion	6 sets, 18 items

data) ranging in age from 10 to 13 years from fifth ($n = 88$, 11.6%), sixth ($n = 288$, 38.1%), seventh ($n = 196$, 25.9%), and eighth grades ($n = 184$, 24.3%). Students reported their ethnicity: 43.9% identified as White, 8.6% as Hispanic, 8.6% as Asian, 3.3% as African American, 1.6% as multiracial. Thirty-four percent of the students did not report their race.

Missing data. Approximately 19% of the fifth- and sixth-grade students did not report their age on the survey. More than 85% of both the fifth- and sixth-grade students who reported their age were 10 and 11 year old, respectively. Therefore, we created an age proxy based on the modal age within the grade of the students from which that individual was selected, such that students without age data in fifth grade were assigned age 10 and those in sixth grade age 11 (the mean, median, and mode for all grades were identical with rounding). The n s for each age group were 119, 262, 188, and 187, respectively, for 10-, 11-, 12-, and 13-year-olds.

MSCEIT-YV test description. The MSCEIT-YV can be administered individually or in groups and is appropriate for children aged 10 to 17 years. The research version of the MSCEIT-YV contained 180 items divided among 4 sections, each representing 1 of the 4 abilities described by the EI framework (Mayer & Salovey, 1997). Initial analyses by the test developers led to a revised scoring algorithm and test based on 97 items (Mayer et al., in press). The items included on the MSCEIT-YV are based on a thorough review of the literature, and they sample from different aspects of the four abilities, but are acknowledged neither to be comprehensive, because to design a test that way would overly tax adolescent (or any other) test responders. Table 1 summarizes the type of tasks on the MSCEIT-YV designed to assess each of the four abilities.

Perceiving emotions: This ability is assessed through identification of emotions in eight photographed faces of youth. Respondents are asked to identify the extent to which

each of 4 emotions (e.g., surprise, anger, fear, happiness) is present on each of the 8 faces using a 5-point Likert-type response scale (1 = *none at all* to 5 = *a very strong feeling*), yielding 4 items across 8-item parcels (i.e., 32-item responses). Scoring is according to the similarity of the participant's profile of emotional identifications for a given face, compared to that of expert judges.

Using emotions: This ability is assessed by asking respondents to compare emotions to a variety of physical sensations in a cross-modality matching-type task. For example, in one task respondents first are asked to imagine feeling angry after another person breaks a prized object of theirs, and then rate the extent to which that feeling of anger is like each of the following terms: *hot, red, relaxed, and heavy* (terms vary across the item prompts). Respondents use a 5-point Likert-type scale (1 = *does not feel this way* to 5 = *definitely feels this way*). This section includes six sets of parcels each with four items (i.e., 24 items).

Understanding emotions: This ability is assessed by asking respondents to identify the definition or causes of emotions. For example, on one task respondents match an emotion term with a description of a hypothetical situation, such as, "When you worry that something awful and dangerous is about to happen, you feel. . . ." Using a multiple-choice format, respondents select the best term from a list of five emotion terms (e.g., sadness, envy, fear, frustration, or jealousy). Twenty-three items are distributed across three types of tasks: causes of emotion, complex emotion blends, and progression of emotional intensity.

Managing emotions: This ability is assessed by vignettes and questions asking respondents to evaluate the effectiveness of several actions in making an individual feel a certain way. A situation is described wherein the target character is feeling one way but needs to feel a different way in order to complete a task (e.g., your friend has been sad recently and you want to do something to cheer her up). Several actions are described following this description (e.g., play something your friend enjoys; encourage your friend to spend some time alone). Respondents indicate the extent to which the action would help the target character achieve the specified goal using a 5-point scale (1 = *not at all helpful* to 5 = *very helpful*). This section includes 6 situations with 3 alternatives to be evaluated for a total of 18 items.

Scoring the MSCEIT-YV. Performance on the MSCEIT-YV is calculated using expert scoring, such that correct answers are determined by compiling the judgments of experts in emotions, which resembles scoring techniques used in cognitive ability tests (see Roberts, Zeidner, & Matthews, 2001). As noted above, test items and their answers were derived from the extant literature on emotion skills. The authors of the test then wrote a scoring manual presenting the research relevant to each of the four abilities and test items. Two advanced PhD psychology students reviewed the scoring manual and made revisions, much as they would review a journal article. The test authors presented a revised scoring manual to five independent reviewers with doctorates in psychology and asked them to identify the correct answers for each test item by referring to the relevant literature. The judges provided a score for each item, assigning 2 points for a plainly correct response, 1 point for a response that was likely or possibly correct, and 0 points for an incorrect response. An index of agreement was computed for each item. Next, the authors convened an expert panel of three independent doctoral-level psychologists who reviewed the answers and resolved disagreements in scoring. When it was not possible to resolve scoring disagreements, these items were assigned 0.5 or 1.5 points or deleted from the final version of the assessment. The final scoring assigned 2, 1, or 0 points to most items, and for a few items, 0.5 or 1.5 points. Total MSCEIT-YV scores and ability subtest scores were computed as empirical percentiles and then standardized to a normal scale, like intelligence, with a mean of 100 and a standard deviation of 15.

Procedure. The parents of students in each classroom received a letter signed by the superintendent and the principal investigator describing the research project as well as an informed consent letter to sign. Parents who agreed to let their child participate returned the completed informed consent form to their child's teacher. Participating students completed the MSCEIT-YV during two group-testing sessions to prevent fatigue. Trained research aides administered the test by reading each item and the response options aloud as students filled in bubble sheets to report their responses to each item.

Results and Discussion

Conceptualizing the MSCEIT-YV for item analyses. As Table 1 shows, each test section includes items for one of the EI abilities specified by the four-domain model: perceiving, using, understanding, or regulating emotion. Within each section are differently formatted items. Section 1 (Perceiving) includes eight faces of children (half male, and a variety of races). For each face, respondents rate the extent to which each of four emotions (e.g., happy, sad, surprise, and fear) is present using a 1 (*none at all*) to 5 (*a very strong feeling*) Likert-type response scale. Some of the items are free standing, in the sense that they contain their own question (stem) and answer alternatives. Many items are grouped together and follow one stem. For example, a single face may be associated with several questions about it, and these questions are then combined into a profile for examination. Because of this, the application of item parceling was appropriate, and each of the four abilities was divided for subsequent analyses into parcels. Where items naturally grouped together, those groupings were identified as parcels. In sum, the perceiving emotion tasks included eight parcels, the using emotion tasks included six, the understanding emotion tasks included three, and the regulating emotion tasks included six. To calculate scores for the CFA, we added up the total points for each item within each parcel for each of the abilities, yielding five scores: one for each of the four abilities (perceiving, using, understanding, and managing), and a total EI score.

MSCEIT-YV reliability. Two methods were used to compute the reliability of the MSCEIT-YV. Because items were homogeneous within branches, coefficient alphas were employed. Across branches, items were heterogeneous in form, and split-half reliabilities were used. For the branches, the Cronbach's alphas were computed and ranged from $\alpha = .70$ to $.79$. The split-half reliability with the Spearman–Brown correction for the total score was $.81$.

CFA of the MSCEIT-YV. Mayer and Salovey's (1997) four-branch model of EI posits that the construct is hierarchical, with a general EI factor, divisible into four distinct skill areas. Empirical research with the MSCEIT (adult version; see Mayer, Salovey, & Caruso, 2008, for a review), suggests that EI represents an overall cohesive domain, with four specific subareas of abilities (alternative structures also have been proposed, see Gignac, 2005; Maul, 2011; Palmer et al., 2005). To test the theory, we ran a higher-order factor model using CFA with maximum likelihood estimation in AMOS 18.0.2 (Arbuckle, 2009). We tested model fit using traditional indices: Chi-square (χ^2), the Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), and Standardized Root Mean Square Residual (SRMR; Kline, 2005).

To identify the model, the scale of the higher-order factor (i.e., EI) was fixed by forcing one of its loadings to 1. The fit indices of the model were $\chi^2(226) = 578.94$, $p < .001$ ($\chi^2/df = 2.54$), RMSEA = $.05$ (confidence intervals = $.04$ – $.05$, $p = .937$), CFI = $.91$, TLI = $.90$, and SRMR = $.06$, which suggested adequate to very good model fit. Figure 1 shows the standardized parameter estimates for the model. Only measurement error for understanding emotion was not significant, estimate = 0.012 , $SE = 0.008$, $p = .127$. These findings provide preliminary empirical support for a higher-order factor structure of the MSCEIT-YV, as specified by EI theory.

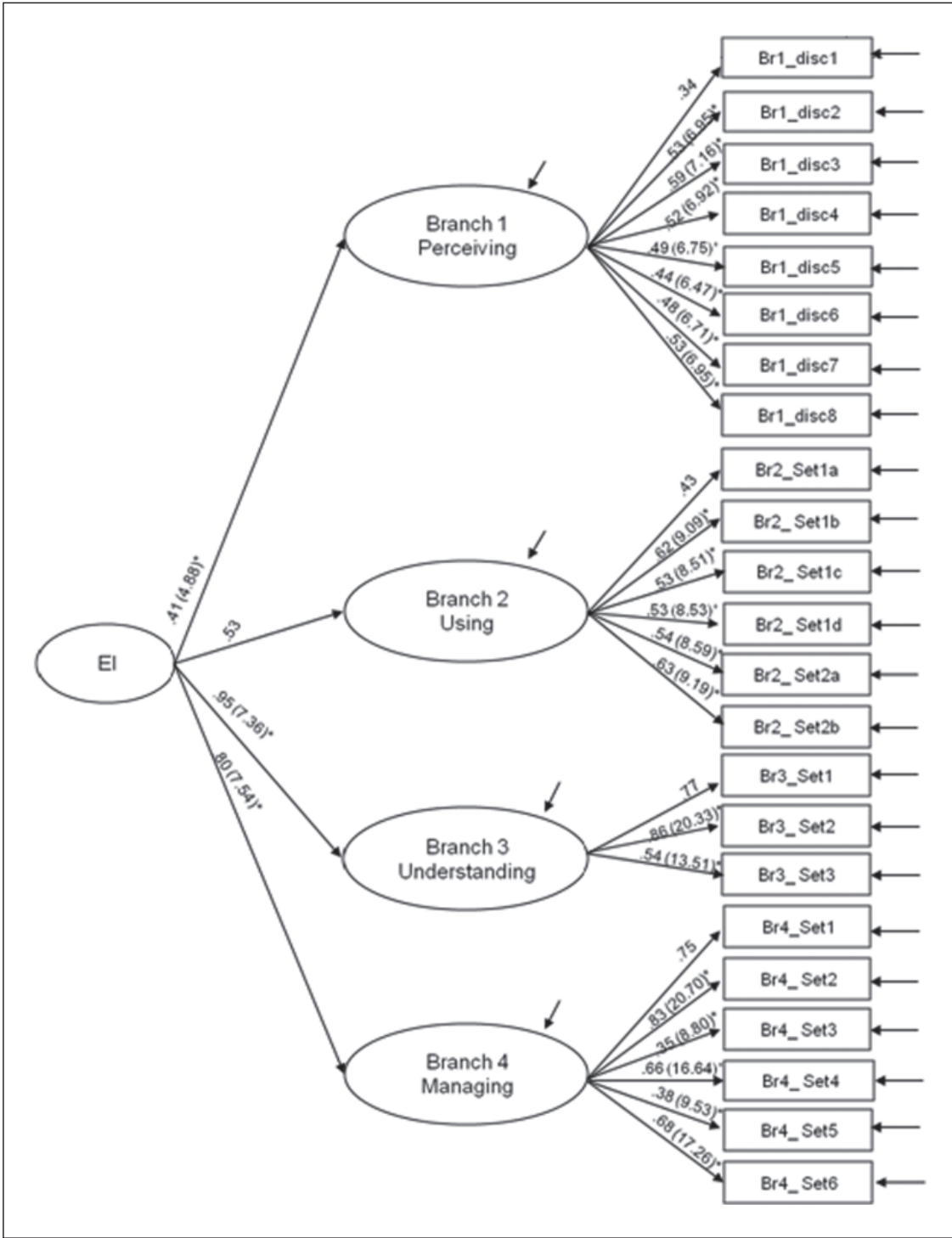


Figure 1. Standardized Estimates of the Higher-Order Factor Model (Model 2). Critical Ratios of Estimates Are Listed in Parentheses Next to the Estimate; Estimates With No Critical Ratios Were Fixed to 1.0
* $p < .001$.

Gender and age differences in scores. To examine mean differences and interactions, we first computed a 2 (gender: boy, girl) by 4 (age: 10, 11, 12, 13) analysis of variance (ANOVA) using the total MSCEIT-YV score as the dependent variable. Main effects for gender, $F(1, 730) = 39.76$,

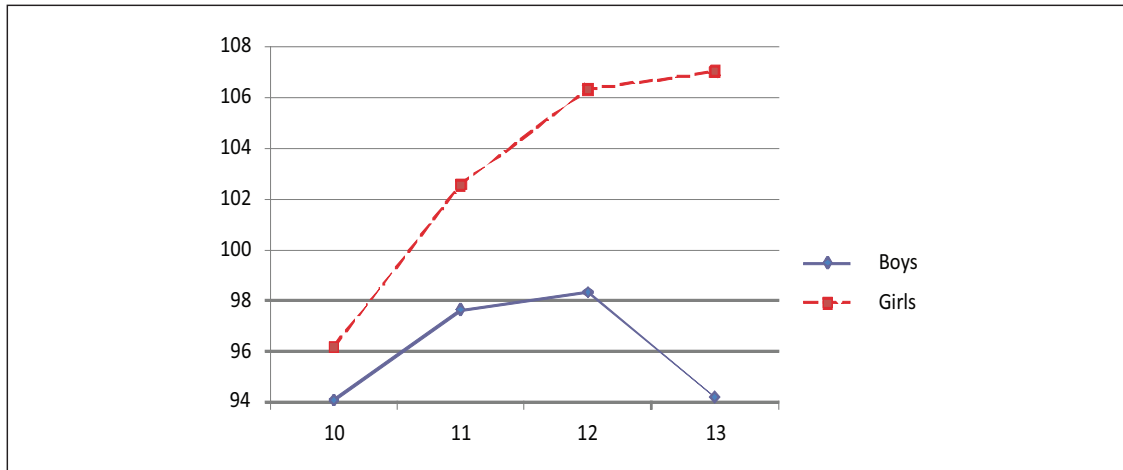


Figure 2. Estimated Marginal Means for Total Scores on the MSCEIT-YV, Age Group by Gender (Study 1)
 Note: MSCEIT-YV = Mayer–Salovey–Caruso Emotional Intelligence Test—Youth Version.

Table 2. Marginal Means (Standard Errors) of Total MSCEIT-YV Scores, Gender, and Age

Gender Comparison				
Boys		Girls		Significance Test
96.06 ^a (0.77)		103.03 ^b (0.79)		***
Age Comparisons				
10 Years	11 years	12 Years	13 Years	Significance Test
95.12 ^a (1.31)	100.11 ^b (0.89)	102.33 ^b (1.06)	100.61 ^b (1.11)	***

Note: MSCEIT-YV = Mayer–Salovey–Caruso Emotional Intelligence Test—Youth Version. Within a row, means with different superscripts are significantly different.

*** $p < .001$

$p < .001$, partial $\eta^2 = .052$, and age, $F(3, 730) = 6.27, p < .001$, and partial $\eta^2 = .025$, were both significant, with girls scoring significantly higher on the MSCEIT-YV than boys (see Figure 2 and Table 2). For age, post hoc analyses using Tukey’s HSD showed that 10-year-olds scored significantly lower than 11- through 13-year-olds, with no significant differences between these older participants. The Gender by Age interaction also was significant, $F(3, 730) = 3.99, p = .008$, partial $\eta^2 = .016$ (see Figure 2). Post hoc analyses showed no significant differences across the age groups in MSCEIT-YV scores for boys, $F(3, 371) = 1.82, p > .10$, partial $\eta^2 = .014$. Significant differences for girls, however, did emerge across the age groups, $F(3, 359) = 9.60, p < .001$, partial $\eta^2 = .074$. Post hoc analyses showed that, among girls, scores increased significantly with age, but leveled off at age 12 with no significant difference in scores between girls who were 12 and 13 years old.

Next, we examined the mean differences and interactions for each of the four abilities, using a 2 (gender) by 4 (age: 10, 11, 12, 13) multivariate ANOVA design with the four ability scores as the dependent variables. Again, girls scored significantly higher than boys on each ability of the MSCEIT-YV, $F(4, 727) = 11.51, p < .001$, partial $\eta^2 = .060$. Age differences also were significant, $F(12, 2187) = 9.28, p < .001$, partial $\eta^2 = .048$, with differences significant for the first three

Table 3. Descriptive Statistics of MSCEIT-YV Ability Scores, Gender by Age

N	Boys		Girls		Total	
	375		363		738	
Age	M	SD	M	SD	M	SD
Perceiving						
10	95.37	17.53	99.50	13.22	97.38	15.65
11	102.49	14.38	103.86	13.11	103.20	13.72
12	98.37	16.24	100.83	14.83	99.45	15.64
13	96.19	16.29	98.49	13.94	97.37	15.13
Total	98.78	16.06	101.18	13.86	99.96	15.06
Using						
10	95.56	13.01	95.94	16.18	95.70	14.58
11	96.97	14.31	97.92	13.18	97.46	13.72
12	102.82	14.41	106.61	13.36	104.50	14.05
13	98.13	16.95	105.19	15.52	101.75	16.57
Total	98.64	14.96	101.32	14.91	99.96	14.98
Understanding						
10	94.19	14.09	94.64	12.92	94.41	13.47
11	97.14	14.28	100.95	13.59	99.11	14.04
12	99.28	15.87	105.13	12.93	101.86	14.90
13	95.99	18.16	108.78	12.27	102.53	16.66
Total	97.00	15.66	102.78	13.79	99.84	15.04
Regulating						
10	96.80	14.85	99.48	14.96	98.11	14.90
11	98.65	14.69	105.16	13.62	102.02	14.49
12	95.35	15.25	104.48	13.67	99.38	15.23
13	93.22	15.31	104.50	14.19	98.99	15.75
Total	96.22	15.10	103.94	14.07	100.01	15.09

Note: MSCEIT-YV = Mayer–Salovey–Caruso Emotional Intelligence Test—Youth Version; 10 years ($n = 119$), 11 years ($n = 261$), 12 years ($n = 188$), and 13 years ($n = 170$).

abilities (perceiving, using, and understanding) and a trend for the regulating emotions ($p = .059$, partial $\eta^2 = .010$). For perceiving, 11-year-old participants scored higher than all other age groups; a similar trend emerged for regulating emotions. For both using and understanding emotion, 12- and 13-year-old participants had higher scores than 10- and 11-year-olds.

The Gender by Age interaction was significant, $F(12, 2187) = 1.78$, $p < .05$, partial $\eta^2 = .010$, but post hoc analyses showed that this was only for understanding emotions, $F(3, 748) = 5.12$, $p < .01$, partial $\eta^2 = .021$. There were no significant differences in scores on the understanding emotion items across the age groups for boys, $F(3, 371) = 1.52$, $p = .21$. Significant differences for girls, however, did emerge across the age groups, $F(3, 359) = 15.48$, $p < .001$, partial $\eta^2 = .115$. Table 3 reports the means and standard deviations. Just as with the total scores, among girls, understanding emotion scores increased significantly with age, but leveled off at age 12 with no significant difference in scores between girls who were 12 and 13 years old.

The group differences in total EI and ability subtest scores showed that girls, in general, scored higher than boys and that scores increased to some extent with age. The plateau and potential drop-off in the scores among the older students in the sample may raise questions about

the validity of the test; according to EI theory, these skills develop with age and experience. However, emerging research shows that the developing brain of the adolescent is undergoing many changes in the socioemotional systems (Casey, Getz, & Galvan, 2008; Steinberg, 2008). More research on developmental trajectories of EI among youth are needed to clarify whether the preliminary findings with the MSCEIT-YV reflect issues of validity with the measurement tool, data collection methods, or developmental changes in socioemotional systems that may interrupt developmental trajectories for these skills in adolescence.

Study 2

The purpose of Study 2 was to further explore the validity of the MSCEIT-YV by examining its correlates in youth using a subsample of students from Study 1. In this study, we examined relationships between scores on the test and both teacher and student reports of academic, social, and personal functioning using subscales from the Behavioral Assessment System for Children (BASC; Reynolds & Kamphaus, 1992). We also examined relationships between MSCEIT-YV scores and report card grades in English language arts (ELA), math, and work habits in a portion of the sample (students in half of the classrooms included in this study were participating in an intervention designed to increase their emotion skills). We examined all associations using both zero-order correlations and partial correlations (controlling for statewide standardized test scores).

Following the postulates of EI theory, we expected higher scores on the MSCEIT-YV would be correlated positively with positive functioning variables such as study and leadership skills and positive relationships with peers, teachers, and parents, and correlated negatively with variables reflecting maladjustment or poorer functioning such as stress, anxiety, depression, conduct behavior problems, and dislike of school. We also expected MSCEIT-YV scores to correlate positively with year-end grades.

Method

Sample. Participants in this study included students from fifth- and sixth-grade classrooms in one of the school districts described in Study 1. In this sample, the ethnic and racial background of students was diverse (58.6% White, 21.6% Hispanic, 10.3% Asian, 8.4% African American, and 1.1% unidentified). Relatively few students were eligible for free lunch (<7%), an indicator of socioeconomic status. Eighty percent ($n = 273$) of all of the fifth- and sixth-grade students ($n = 137, 136$, respectively; 55% female) classrooms had parental permission to participate. Students' average age was 11 years ($SD = 1$).

Measures and Procedure

Emotional intelligence. To assess emotion skills, data from participating students who completed the MSCEIT-YV in Study 1 were used.

Social and emotional competence. Teacher and student reports from the BASC were used for a global behavioral assessment of social and emotional competence (Reynolds & Kamphaus, 1992). The BASC is a comprehensive multidimensional assessment that has been normed on large representative samples as well as clinical samples. The scales demonstrate high internal consistency and test–retest reliability (Reynolds & Kamphaus, 1992). Reliabilities (Cronbach's alphas) ranged from .69 to .92 for the teacher report composites and .75 to .91 for the student report composites. This aligns with reliabilities reported in the BASC technical manual (Reynolds & Kamphaus, 1992).

Table 4. Descriptive Statistics for MSCEIT and BASC Scores (Teacher and Student Reports), *M*(*SD*)

	Full Sample	Girls	Boys	Significant Differences
MSCEIT-YV	94.69 (14.75)	95.87 (14.47)	93.60 (14.99)	
BASC				
Teacher reports				
1. Externalizing	8.81 (10.59)	6.03 (7.86)	11.26 (12.03)	**
2. Internalizing	4.22 (4.43)	3.84 (4.20)	4.56 (4.62)	
3. School problems	11.80 (9.46)	9.98 (8.24)	13.41 (10.19)	**
4. Adaptive skills	47.28 (18.58)	48.92 (17.51)	45.82 (19.44)	
5. Behavioral symptoms	19.07 (16.59)	14.77 (12.99)	22.88 (18.47)	
student reports				
6. School maladjustment	4.02 (3.77)	3.57 (3.68)	4.44 (3.82)	
7. Clinical maladjustment	20.01 (14.51)	20.85 (14.32)	19.24 (14.70)	
8. Personal adjustment	206.87 (3.09)	206.53 (3.08)	207.18 (3.08)	
9. Emotional symptoms	203.21 (15.82)	204.13 (15.50)	202.36 (16.14)	

Note: MSCEIT-YV = Mayer–Salovey–Caruso Emotional Intelligence Test—Youth Version; BASC = Behavioral Assessment System for Children; for teacher reports on the externalizing composite, $F(1, 194) = 12.60, p < .001$, partial $\eta^2 = .061$, and for teacher reports on the school problems composite, $F(1, 194) = 12.32, p = .001$, partial $\eta^2 = .033$

For the teacher report, teachers received and completed a survey for each participating student in their classroom. Each survey was labeled with the name of a student, and teachers indicated the extent to which each student in their class engaged in each of 148 behaviors (e.g., “Gives up easily when learning something new”; “Skips classes at school”; “Is creative”; “Studies with other students”) using a 4-point scale with the following response options: 0 = *never*, 1 = *sometimes*, 2 = *often*, and 3 = *always*. The teacher version is comprised of four primary composite scales reflecting *externalizing problems* (e.g., hyperactivity, aggression, conduct problems), *internalizing problems* (e.g., anxiety, depression, somatization), *school problems* (e.g., attention problems, learning problems), and *adaptability* (e.g., social skills, leadership, study skills).

For the student report, students responded to each of the 152 items by indicating whether the brief statement was true or false. The student version is comprised of four primary composite scales reflecting *school maladjustment* (negative attitudes toward school and teachers), *clinical maladjustment* (atypicality, locus of control, social stress, and anxiety), *personal adjustment* (positive relationship with parents, interpersonal relationships, self-esteem, and self-reliance), and *emotional symptoms* (social stress, anxiety, depression, sense of inadequacy, poor interpersonal relationships, and low self-esteem).

Reading and math ability. Reading and math scores (national percentiles) from the TerraNova, a series of standardized achievement tests used in the U.S. designed to assess student achievement, were collected from the school district and served as a proxy for reading and math ability. Because the MSCEIT-YV is largely verbal, we used scores on the TerraNova as covariates.

Grades. Report cards submitted by school principals provided end-of-year grades in ELA, math, and work habits.

Table 5. Correlations of Social and Emotional Competence Indicators and Total Scores on the MSCEIT-YV

	Zero Order			Partial Correlations		
	Full Sample	Girls	Boys	Full Sample	Girls	Boys
<i>N</i>	203	92	105	162	74	85
Teacher reports						
1. Externalizing	-.26***	-.26**	-.26***	-.17***	-.14	-.20
2. Internalizing	-.35***	-.39***	-.32***	-.17**	-.26**	-.10
3. School problems	-.56***	-.51***	-.60***	-.24**	-.21*	-.27**
4. Adaptive skills	.37***	.28***	.43***	.10	.05	.14
5. Behavioral symptoms student reports	-.40***	-.42***	-.40***	-.21***	-.21*	-.23**
6. School maladjustment	-.31***	-.28***	-.32***	-.27***	-.27**	-.27**
7. Clinical maladjustment	-.16**	-.16	-.17*	-.17**	-.12	-.21**
8. Personal adjustment	.09	.10	.10	-.01	.18	-.12
9. Emotional symptoms	-.20***	-.18*	-.23**	-.19**	-.12	-.24**

Notes: Partial correlation controls for standardized test score (TerraNova) in reading, national percentile (listwise analysis). * $p < .10$. ** $p < .05$. *** $p < .01$.

Results and Discussion

Table 4 reports the descriptive statistics on the MSCEIT-YV and the BASC for teachers and students. As the table shows, there were significant gender differences on two composite scales of the teacher BASC ratings; boys were rated higher than girls on both externalizing behaviors and school problems, meaning boys exhibited more externalizing behaviors and more school problems than girls. These findings are not surprising as abundant research shows that boys use more outward aggression in school than girls do (Bjorkqvist, 1994; Russell & Owens, 1999), tend to lose academic motivation as they approach middle school (Anderman & Maehr, 1994), and are often outperformed by girls in certain academic subjects (Marks, 2008).

Table 5 reports the zero-order and partial correlations between MSCEIT scores and teacher and student BASC scores for the whole sample and also separately for each gender. The partial correlations use scores on the TerraNova Reading Test as a covariate and allow us to look at the relationship between EI and behavior controlling, approximately, for verbal ability.

Teacher ratings of social and emotional competence.

Table 5 shows that zero-order correlations between scores on the teacher-rated BASC and the MSCEIT-YV all were significant. Across both genders and in the full sample, there were significant correlations between scores on the MSCEIT-YV and teacher ratings. These correlations indicated that the higher the student's MSCEIT-YV scores, the fewer externalizing, internalizing, school, and behavioral problems were perceived by the teacher ($r_s = -.26$ to $-.56$, $p_s < .01$). More specifically, teachers evaluated students with high MSCEIT-YV scores as being lower in hyperactivity, aggression, conduct problems, anxiety, depression, attention and learning problems, and overall problem behavior. Table 5 lists the correlation coefficients separately by gender. In general, the relationship patterns are consistent, and none of the coefficients are significantly different from each other (using Fisher's z transformation).

Nearly all of the associations between MSCEIT-YV and BASC teacher scores remained statistically significant after controlling for reading ability, although the effect sizes decreased. Only the positive correlation with adaptive skills (e.g., social skills, leadership skills) became nonsignificant. These relationships showed that students with higher MSCEIT-YV scores had teachers who rated them as being more socially and emotionally competent (i.e., lower ratings on externalizing, internalizing, school problems, and behavioral symptoms composite scales on the BASC). It should be noted that this control may underestimate EI's effect. As EI tends to overlap modestly with overall IQ, it is possible that some of the variance of EI may have been partialled out.

Student ratings of social and emotional competence.

Table 5 shows that student self-reports on three of the four BASC scales also correlated significantly with MSCEIT-YV total scores. Students with higher MSCEIT scores had higher self-rated social and emotional competence, less clinical maladjustment, and fewer emotional symptoms ($r_s = -.16$ to $-.31$, $p_s < .05$). These higher-scoring students exhibited fewer negative attitudes toward their teachers and school, lower atypical thoughts and behavior, less social stress, and lower anxiety and depression on the BASC. These relationships remained statistically significant after controlling for reading ability. As with teacher ratings, the relationship patterns were consistent between girls and boys, with no significant differences between the coefficients.

The most robust, positive association was with school maladjustment followed by emotional symptoms. These findings are consistent with research on the adult version of the MSCEIT (Hertel et al., 2009; O'Connor & Little, 2003), demonstrating that emotion skills may buffer students from emotional disturbances like anxiety and depression. Finally, self-ratings of personal adjustment (e.g., positive social relationships with peers and parents) were unrelated to scores on the MSCEIT-YV, which may be explained by the low variance on this scale. This lack of association was surprising because a large number of studies with college students who took the adult version of the MSCEIT show consistent, positive associations between EI and quality interpersonal relationships, a primary component of the scale (Brackett et al., 2006; Lopes et al., 2004).

Academic performance.

Relationships between MSCEIT-YV scores and year-end grades in ELA, math, and work habits were examined for a subsample of participants ($n = 273$). We only analyzed data for this subsample because all other participants were involved in a year-long intervention designed to increase their emotion skills.

For the subsample, zero-order correlations between MSCEIT-YV scores and grades were positive and large to moderate for ELA, $r(65) = .65$, $p < .001$; math, $r(65) = .51$, $p < .001$; and work habits, $r(64) = .38$, $p < .01$. Controlling for TerraNova scores in reading, the relationship between MSCEIT-YV and ELA grades remained statistically significant, although smaller in magnitude, $pr(60) = .34$, $p < .01$, and the relationship between MSCEIT-YV scores and work habits became nonsignificant, $pr(60) = .21$, $p = .10$. Controlling for TerraNova scores in math, the relationship between MSCEIT-YV scores and math was no longer significant, $pr(60) = .15$, $p = .25$. These were especially stringent tests as standardized test scores in reading correlated highly with performance in ELA in the present sample; the zero-order correlation between ELA grades and reading test scores was $r(172) = .63$, $p < .001$, and was $r(172) = .51$, $p < .001$, for math grades and math test scores.

General Discussion

The findings from Study 1 (the combined samples) provide preliminary evidence that EI can be measured reliably with the MSCEIT-YV and that the test's structure both confirms and fits with EI theory. Study 2 shows that MSCEIT-YV scores predict important classroom outcomes among youth. Together, the studies help to establish EI as a standard intelligence that accounts for variance in psychosocial functioning and academic performance beyond the contributions of verbal ability. Each of these points is now discussed in further detail.

EI as a Standard Intelligence

Three major criteria exist for a construct to be considered a standard intelligence: (a) It must consist of mental abilities, (b) the abilities must meet certain correlational criteria, and (c) it must develop with age (Carroll, 1993; Fancher, 1985; Mayer, Caruso, & Salovey, 1999). The present study helped to establish these criteria for EI.

EI is operationalized by the MSCEIT-YV as a construct consisting of four, interrelated emotion abilities or branches (perceiving, using, understanding, and regulating emotion). As predicted, scores on the four branches factored into one hierarchical model, which is congruent with the test's theoretical underpinnings (Mayer & Salovey, 1997). MSCEIT-YV scores correlated modestly with a measure of verbal intelligence, as was hypothesized for a measure of intelligence. Study 1 also indicated, importantly, some indication of a developmental progression of scores for 10- to 13-year-olds, although, contrary to expectations, scores for older boys were attenuated. In Study 2, validity evidence involving criterion relationships for the MSCEIT-YV was found: Scores on the test were associated with social and personal functioning using both student and teacher reports as well as academic performance measured by report card grades. More importantly, the test had modest incremental validity when controlling for standardized test scores in reading and math. Collectively, these findings advance our understanding of measuring EI among youth.

Limitations

Although these findings are promising, there are a number of limitations in these studies. First, the sample for Study 1, though large, needs to be larger in order to test age and gender differences more adequately. The test was written for youth in the age group 10 to 17 years, but the sample in Study 1 only included youth aged between 10 and 13 years. Including a larger sample of youth across a broader age spectrum would provide a better test of the developmental postulates of EI theory than was the case here. Is the drop-off in scores among 13-year-old boys a manifestation of development or of the construction of the test? Perhaps performance on the test is not a valid indicator of EI in older boys, for example, who may not be able to relate to the scenarios presented in the vignettes, or perhaps the emotion skills of older boys, as they enter puberty, are disrupted in their development. The current study also was limited in that the MSCEIT-YV's relationship to competing models of EI was not tested.

In Study 2, the correlates of scores on the MSCEIT-YV were robust across teacher and student ratings and grades but decreased to some extent after controlling for performance on a standardized reading test. Controlling for reading ability was a stringent test, however, as there is some genuine variance in EI accounted for by verbal intelligence; that is, some level of verbal intelligence is needed not just to complete the MSCEIT-YV but also to communicate with others about emotions (one of the abilities described by the ability model of EI). Additional research that includes behavioral assessments of other social, personal, and academic outcomes both within and outside of the school context and peer reports would provide further

evidence for the correlates of EI, as assessed by the MSCEIT-YV. Future research including measures of personality also would be warranted, given that the adult version of the MSCEIT correlates with some personality constructs (e.g., Van Rooy, Viswesvaran, & Pluta, 2005), and Agreeableness, Conscientiousness, and Openness predict various student outcomes (Poropat, 2009). In general, more research is necessary to both establish EI as a viable construct and to further validate assessments such as the MSCEIT-YV.

Implications

The existence of a valid and reliable test to assess emotion skills such as those described by the ability model of EI (Mayer & Salovey, 1997) will become more and more relevant as education reform moves away from No Child Left Behind (NCLB) and the standards-based movement of the late 1980s and toward legislation that addresses the needs of the whole child (Zigler & Bishop-Josef, 2006). There is a growing concern over American students' ability to compete in the global economy (Boe & Shin, 2005; DeBray, McDermott, & Wohlstetter, 2005; No Child Left Behind Act, 2001).

NCLB and the reliance on academic test scores alone as evidence that youth are proficient in math, reading, and science do not ensure that youth are fully prepared to compete successfully in the global economy. For example, emotional disturbance among our nation's youth is widespread. Children are using prescribed antidepressants at exceedingly high rates (Delate, Gelenberg, Simmons, & Motheral, 2004). Indeed, approximately 10% of youth experience problems with depression (Substance Abuse and Mental Health Services Administration [SAMHSA], 2005) and 8% to 21% have problems with anxiety (Costello, Egger, & Angold, 2005). The impact of these emotional disturbances extends across domains. Youth with a history of anxiety and depression are more likely to engage in risky and maladaptive behaviors, such as using illicit drugs, bullying classmates, withdrawing from friends, and disconnecting from school (SAMHSA, 2005). These behaviors are problematic both to youth themselves—threatening their physical and psychological health and their ability to engage in learning—and to society. The inclusion of curricula that help youth to develop their emotion skills may ameliorate some of these significant problems (Brackett, Rivers, Reyes, & Salovey, 2012). Indeed, programs that aim to build the emotion skills of youth, such as those within the social and emotional learning movement, show promise for increasing academic performance and the social and emotional well-being of youth (Durlak et al., 2011). As programs aimed at ameliorating these problems are being increasingly integrated into schools, tools for measuring the social and emotional competencies of youth are becoming more and more necessary. The research presented here suggests that the MSCEIT-YV may be a promising assessment of emotion skills in youth.

Conclusion

EI is a set of mental abilities that relies on both the emotion and cognitive systems to enhance reasoning and solve emotion-laden problems. The MSCEIT-YV is an assessment tool for youth that operationalizes EI as four abilities: perceiving, using, understanding, and managing emotion. The research presented here shows that these four abilities can be measured reliably and that the factor structure is consistent with the theoretical model. Scores on the test also predict important academic and psychosocial outcomes among youth. Although research on EI among youth is in its early stages, the findings reported here are promising and will hopefully lead to additional studies on the topic.

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References

- Alicke, M. D. (1985). Global self-evaluation as determined by the desirability and controllability of trait adjectives. *Journal of Personality and Social Psychology, 49*, 1621-1630.
- Anderman, E. M., & Maehr, M. L. (1994). Motivation and schooling in the middle grades. *Review of Educational Research, 64*, 287-309.
- Arbuckle, J. L. (2009). *Amos 18.0 user's guide*. Crawfordville, FL: Amos Development Corporation.
- Bar-On, R., & Parker, J. D. A. (Eds.). (2000). *The handbook of emotional intelligence: Theory, development, assessment, and application at home, school, and in the workplace*. San Francisco, CA: Jossey-Bass.
- Bjorkqvist, K. (1994). Sex differences in physical, verbal, and indirect aggression: A review of recent research. *Sex Roles, 30*, 177-188.
- Boe, E., & Shin, S. (2005). Is the United States really losing the international horse race in academic achievement? *Phi Delta Kappan, 86*, 688-696.
- Brackett, M. A., & Geher, G. (2006). Measuring emotional intelligence: Paradigmatic shifts and common ground. In J. Ciarrochi, J. P. Forgas, & J. D. Mayer (Eds.), *Emotional intelligence and everyday life* (2nd ed., pp. 27-50). New York, NY: Psychology Press.
- Brackett, M. A., & Mayer, J. D. (2003). Convergent, discriminant, and incremental validity of competing measures of emotional intelligence. *Personality and Social Psychology Bulletin, 29*, 1147-1158.
- Brackett, M. A., Mayer, J. D., & Warner, R. M. (2004). Emotional intelligence and its relation to everyday behaviour. *Personality and Individual Differences, 36*, 1387-1402.
- Brackett, M. A., Palomera, R., Mojsa-Kaja, J., Reyes, M. R., & Salovey, P. (2010). Emotion-regulation ability, burnout, and job satisfaction among British secondary-school teachers. *Psychology in the Schools, 47*, 406-417.
- Brackett, M. A., Rivers, S. E., Reyes, M. R., & Salovey, P. (in press). Enhancing academic performance and social and emotional competence with the RULER feeling words curriculum. *Learning and Individual Differences, 22*, 218-224.
- Brackett, M. A., Rivers, S. E., Shiffman, S., Lerner, N., & Salovey, P. (2006). Relating emotional abilities to social functioning: A comparison of self-report and performance measures of emotional intelligence. *Journal of Personality and Social Psychology, 91*, 780-795.
- Brackett, M. A., Warner, R. M., & Bosco, J. S. (2005). Emotional intelligence and relationship quality among couples. *Personal Relationships, 12*, 197-212.
- Carroll, J. B. (1993). *Human cognitive abilities: A survey of factor-analytic studies*. New York, NY: Cambridge University Press.
- Casey, B. J., Getz, S., & Galvan, A. (2008). The adolescent brain. *Developmental Review, 28*, 62-77.
- Clore, G. L., Ortony, A., & Foss, M. A. (1988). The psychological foundations of the affective lexicon. *Journal of Personality and Social Psychology, 53*, 751-766.
- Costello, E. J., Egger, H. L., & Angold, A. (2005). The developmental epidemiology of anxiety disorders: Phenomenology, prevalence, and comorbidity. *Child And Adolescent Psychiatric Clinics of North America, 14*, 631-648.

- Darwin, C. (1999). *The expression of the emotions in man and animals*. New York, NY: HarperCollins. (Original work published 1872)
- DeBray, E. H., McDermott, K. A., & Wohlstetter, P. (2005). Introduction to the special issues of federalism reconsidered: The case of No Child Left Behind Act. *Peabody Journal of Education, 80*, 1-18.
- Delate, T., Gelenberg, A. J., Simmons, V. A., & Motheral, B. R. (2004). Trends in the use of antidepressants in a national sample of commercially insured pediatric patients, 1998-2002. *Psychiatric Services, 55*, 387-391.
- Denham, S. A. (1998). *Emotional development in young children*. New York, NY: Guilford.
- Denham, S. A., Blair, K. A., DeMulder, E., Levitas, J., Sawyer, K., Auerbach-Major, S., Queenan, P. (2003). Preschool emotional competence: Pathway to social competence. *Child Development, 74*, 238-256.
- Dunning, D., Johnson, K., Ehrlinger, J., & Kruger, J. (2003). Why people fail to recognize their own incompetence. *Current Directions in Psychological Science, 12*, 83-87.
- Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotion learning: A meta-analysis of school-based universal interventions. *Child Development, 82*, 405-432.
- Eisenberg, N., Fabes, R. A., Guthrie, I. K., & Reiser, M. (2000). Dispositional emotionality and regulation: Their role in predicting quality of social functioning. *Journal of Personality and Social Psychology, 78*, 136-157.
- Eisenberg, N., Fabes, R. A., Murphy, B., Maszk, P., Smith, M., & Karbon, M. (1995). The role of emotionality and regulation in children's social functioning: A longitudinal study. *Child Development, 66*, 1360-1384.
- Ekman, P. (1973). *Darwin and facial expression: A century of research in review*. Oxford, UK: Academic Press.
- Ekman, P. (2003). *Emotions revealed*. New York, NY: Henry Holt.
- Fancher, R. E. (1985). *The intelligence men: Makers of the IQ controversy*. New York, NY: Norton.
- Farrelly, D., & Austin, E. (2007). Ability EI as an intelligence? Associations of the MSCEIT with performance on emotion processing and social tasks and with cognitive ability. *Cognition & Emotion, 21*, 1043-1063.
- Feldman, R. S., Philippot, P., & Custrini, R. J. (1991). Social competence and nonverbal behavior. In R. S. Feldman & B. Rime (Eds.), *Fundamentals of nonverbal behavior* (pp. 329-350). New York, NY: Cambridge University Press.
- Fine, S. E., Izard, C. E., Mostow, A. J., Trentacosta, C. J., & Ackerman, B. P. (2003). First grade emotion knowledge as a predictor of fifth grade self-reported internalizing behaviors in children from economically disadvantaged families. *Development and Psychopathology, 15*, 331-342.
- Fredrickson, B. L. (1998). What good are positive emotions? *Review of General Psychology, 2*, 300-319.
- Frijda, N. H. (1986). *The emotions*. Cambridge, UK: Cambridge University Press.
- Gignac, G. E. (2005). Evaluating the MSCEIT V2.0 via CFA: Comment on Mayer et al. (2003). *Emotion, 5*, 233-235.
- Goleman, D. (1995). *Emotional intelligence*. New York, NY: Bantam.
- Greenberg, M. T., Kusche, C. A., & Riggs, N. (2004). The PATHS curriculum: Theory and research on neurocognitive development and school success. In J. E. Zins, R. P. Weissberg, M. C. Wang, & H. J. Walberg (Eds.), *Building academic success on social and emotional learning: What does the research say?* (pp. 170-188). New York, NY: Teachers College Press.
- Grewal, D., & Salovey, P. (2005). Feeling smart: The science of emotional intelligence. *American Scientist, 93*, 330-339.
- Grubb, W. L., & McDaniel, M. A. (2007). The fakability of Bar-On's Emotional Quotient Inventory Short Form: Catch me if you can. *Human Performance, 20*, 43-59.
- Halberstadt, A. G., Denham, S. A., & Dunsmore, J. C. (2001). Affective social competence. *Social Development, 10*, 79-119.

- Hertel, J., Schutz, A., & Lammers, C. H. (2009). Emotional intelligence and mental disorder. *Journal of Clinical Psychology, 65*, 942-954.
- Isen, A. M. (1987). Positive affect, cognitive processes, and social behavior. *Advances in Experimental Social Psychology, 20*, 203-253.
- Isen, A. M., & Daubman, K. A. (1984). The influence of affect on categorization. *Journal of Personality and Social Psychology, 47*, 1206-1217.
- Isen, A. M., Daubman, K. A., & Nowicki, G. P. (1987). Positive affect facilitates creative problem solving. *Journal of Personality and Social Psychology, 52*, 1122-1131.
- Izard, C. E. (1989). The structure and functions of emotions: Implications for cognition, motivation, and personality. In I. S. Cohen (Ed.), *The G. Stanley Hall lecture series* (Vol. 9, pp. 39-73). Washington, DC: American Psychological Association.
- Izard, C. E., Fine, S., Schultz, D., Mostow, A. J., Ackerman, B., & Youngstrom, E. (2001). Emotion knowledge as a predictor of social behavior and academic competence in children at risk. *Psychological Science, 12*, 18-23.
- Izard, C. E., Trentacosta, C. J., King, K. A., & Mostow, A. J. (2004). An emotion-based prevention program for Head Start children. *Early Education and Development, 15*, 407-422.
- Jamison, K. R. (2004). *Exuberance: The passion for life*. New York, NY: Knopf.
- Jausovec, N., Jausovec, K., & Gerlic, I. (2001). Differences in event-related and induced electroencephalography patterns in the theta and alpha frequency bands related to human emotional intelligence. *Neuroscience Letters, 311*, 93-96.
- Kee, K. S., Horan, W. P., Salovey, P., Kern, R. S., Sergi, M. J., Fiske, A. P., . . . Green, M. F. (2009). Emotional intelligence in schizophrenia. *Schizophrenia Research, 107*, 61-68.
- Keltner, D., & Haidt, J. (2001). Social functions of emotions. In T. J. Mayne & G. A. Bonanno (Eds.), *Emotions: Current issues and future directions* (pp. 192-213). New York, NY: Guilford.
- Kindlon, D., & Thompson, M. (2000). *Raising Cain: Protecting the emotional life of boys*. New York, NY: Ballantine Books.
- Kline, R. B. (2005). *Principals and practice of structural equation modeling* (2nd ed.). New York, NY: Guilford.
- Lazarus, R. S. (1991). *Emotion and adaptation*. New York, NY: Oxford University Press.
- Lopes, P. N., Brackett, M. A., Nezlek, J. B., Schutz, A., Sellin, I., & Salovey, P. (2004). Emotional intelligence and social interaction. *Personality and Social Psychology Bulletin, 30*, 1018-1034.
- Lopes, P. N., Grewal, D., Kadis, J., Gall, M., & Salovey, P. (2006). Evidence that emotional intelligence is related to job performance and affect and attitudes at work. *Psicothema, 18*, 132-138.
- Lopes, P. N., & Salovey, P. (2004). Toward a broader education: Social, emotional and practical skills. In J. E. Zins, R. P. Weissberg, M. C. Wang, & H. J. Walberg (Eds.), *Building academic success on social and emotional learning: What does the research say?* (pp. 76-93). New York, NY: Teachers College Press.
- Lopes, P. N., Salovey, P., Cote, S., & Beers, M. (2005). Emotion regulation abilities and the quality of social interaction. *Emotion, 5*, 113-118.
- Lopes, P. N., Salovey, P., & Straus, R. (2003). Emotional intelligence, personality, and the perceived quality of social relationships. *Personality and Individual Differences, 35*, 641-658.
- Mabe, P. A., & West, S. G. (1982). Validity of self-evaluation of ability: A review and meta-analysis. *Journal of Applied Psychology, 67*, 280-296.
- Marks, G. N. (2008). Accounting for the gender gaps in student performance in reading and mathematics: Evidence from 31 countries. *Oxford Review of Education, 34*, 89-109.
- Márquez, P. G., Martín, R. P., & Brackett, M. A. (2006). Relating emotional intelligence to social competence and academic achievement in high school students. *Psicothema, 18*, 118-123.
- Matthews, G., Roberts, R. D., & Zeidner, M. (2004). Seven myths about emotional intelligence. *Psychological Inquiry, 15*, 179-196.

- Matthews, G., Zeidner, M., & Roberts, R. D. (2002). *Emotional intelligence: Science and myth*. Cambridge, MA: MIT Press.
- Maul, A. (2011). The factor structure and cross-test convergence of the Mayer-Salovey-Caruso model of emotional intelligence. *Personality and Individual Differences, 50*, 457-463.
- Mayer, J. D., Caruso, D. R., & Salovey, P. (1999). Emotional intelligence meets traditional standards for an intelligence. *Intelligence, 27*, 267-298.
- Mayer, J. D., Roberts, R. D., & Barsade, S. G. (2008). Human abilities: Emotional intelligence. *Annual Review of Psychology, 58*, 507-536.
- Mayer, J. D., & Salovey, P. (1997). What is emotional intelligence? In P. Salovey & D. J. Sluyter (Eds.), *Emotional development and emotional intelligence: Educational implications* (pp. 3-34). New York, NY: Basic Books.
- Mayer, J. D., Salovey, P., & Caruso, D. R. (2002a). *Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT): User's manual*. New York, NY: Multi-Health Systems.
- Mayer, J. D., Salovey, P., & Caruso, D. R. (2002b). *Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT), version 2.0*. Toronto, Ontario, Canada: Multi-Health Systems.
- Mayer, J. D., Salovey, P., & Caruso, D. R. (2008). Emotional intelligence: New ability or eclectic traits? *American Psychologist, 63*, 503-517.
- Mayer, J. D., Salovey, P., & Caruso, D. R. (in press). *Mayer-Salovey-Caruso Emotional Intelligence Test: Youth version (MSCEIT: YV): Item booklet*. Toronto, Ontario, Canada: Multi-Health Systems.
- Mayer, J. D., Salovey, P., Caruso, D. R., & Sitarenios, G. (2003). Measuring emotional intelligence with the MSCEIT V2.0. *Emotion, 3*, 97-105.
- No Child Left Behind Act, PL 107-110 (2001).
- Nowicki, S., & Duke, M. P. (2001). Nonverbal receptivity: The Diagnostic Analysis of Nonverbal Accuracy (DANVA). In J. A. Hall & F. J. Bernieri (Eds.), *Interpersonal sensitivity: Theory and measurement* (pp. 183-198). Mahwah, NJ: Lawrence Erlbaum.
- O'Connor, R. M., Jr., & Little, I. S. (2003). Revisiting the predictive validity of emotional intelligence: Self-report versus ability-based measures. *Personality and Individual Differences, 35*, 1893-1902.
- O'Sullivan, M., & Ekman, P. (2004). Facial expression recognition and emotional intelligence. In G. Geher (Ed.), *Emotional intelligence: Common ground and controversy* (pp. 89-109). Hauppauge, NY: Nova Science Publishers, Inc.
- Palfai, T. P., & Salovey, P. (1993). The influence of depressed and elated mood on deductive and inductive reasoning. *Imagination, Cognition and Personality, 13*, 57-71.
- Palmer, B., Gignac, G., Manocha, R., & Stough, C. (2005). A psychometric evaluation of the Mayer-Salovey-Caruso Emotional Intelligence Test Version 2.0. *Intelligence, 33*, 285-305.
- Paulhus, D. L., Lysy, D. C., & Yik, M. S. M. (1998). Self-report measures of intelligence: Are they useful as proxy IQ tests? *Journal of Personality, 66*, 525-554.
- Petrides, K. V., & Furnham, A. (2001). Trait emotional intelligence: Psychometric investigation with reference to established trait taxonomies. *European Journal of Personality, 15*, 425-448.
- Plutchik, R. (1980). *Emotion: A psychoevolutionary synthesis*. New York, NY: Harper & Row.
- Poropat, A. E. (2009). A meta-analysis of the five-factor model of personality and academic performance. *Psychological Bulletin, 135*, 322-338.
- Raver, C. C. (2002). Emotions matter: Making the case for the role of young children's emotional development for early school readiness. *Social Policy Report, 16*, 3-18.
- Reis, D. L., Brackett, M. A., Shamosh, N. A., Kiehl, K. A., Salovey, P., & Gray, J. R. (2007). Emotional intelligence predicts individual differences in social exchange reasoning. *NeuroImage, 35*, 1385-1391.
- Reynolds, C. R., & Kamphaus, R. W. (1992). *Behavior assessment system for children*. Circle Pines, MN: American Guidance Service.

- Rivers, S. E., Brackett, M. A., & Salovey, P. (2008). Measuring emotional intelligence as a mental ability in adults and children. In G. J. Boyle, G. Matthews, & D. H. Saklofske (Eds.), *Handbook of personality theory and testing* (pp. 440-460). London, UK: SAGE.
- Rivers, S. E., Brackett, M. A., Salovey, P., & Mayer, J. D. (2007). Measuring emotional intelligence as a set of mental abilities. In G. Matthews, M. Zeidner, & R. D. Roberts (Eds.), *The science of emotional intelligence: Knowns and unknowns* (pp. 230-257). New York, NY: Oxford University Press.
- Roberts, R. D., Schulze, R., O'Brien, K., MacCann, C., Reid, J., & Maul, A. (2006). Exploring the validity of the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) with established emotions measures. *Emotion, 6*, 663-669.
- Roberts, R. D., Zeidner, M., & Matthews, G. (2001). Does emotional intelligence meet traditional standards for an intelligence? Some new data and conclusions. *Emotion, 1*, 196-231.
- Russell, A., & Owens, L. (1999). Peer estimates of school-aged boys' and girls' aggression to same- and cross-sex targets. *Social Development, 8*, 364-379.
- Saarni, C. (1999). *The development of emotional competence*. New York, NY: Guilford.
- Salovey, P., & Mayer, J. D. (1990). Emotional intelligence. *Imagination, Cognition and Personality, 9*, 185-211.
- Schwarz, N. (1990). Feelings as information: Informational and motivational functions of affective states. In E. T. Higgins & R. M. Sorrentino (Eds.), *Handbook of motivation and cognition: Foundations of social behavior* (Vol. 2, pp. 527-561). New York, NY: Guilford.
- Schwarz, N., & Clore, G. L. (1996). Feelings and phenomenal experiences. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 433-465). New York, NY: Guilford.
- Stein, N. L., & Levine, L. J. (1999). The early emergence of emotional understanding and appraisal: Implications for theories of development. In T. Dalgleish & M. J. Power (Eds.), *Handbook of cognition and emotion* (pp. 383-408). New York, NY: John Wiley.
- Steinberg, L. (2008). A neurobehavioral perspective on adolescent risk-taking. *Developmental Review, 28*, 78-106.
- Substance Abuse and Mental Health Services Administration. (2005). *Overview of findings from the 2004 National Survey on Drug Use and Health*. Rockville, MD: Office of Applied Studies.
- Trinidad, D. R., & Johnson, C. A. (2002). The association between emotional intelligence and early adolescent tobacco and alcohol use. *Personality and Individual Differences, 32*, 95-105.
- Van Rooy, D. L., & Viswesvaran, C. (2004). Emotional intelligence: A meta-analytic investigation of predictive validity and nomological net. *Journal of Vocational Behavior, 65*, 71-95.
- Van Rooy, D. L., Viswesvaran, C., & Pluta, P. (2005). An examination of construct validity: What is this thing called emotional intelligence? *Human Performance, 18*, 445-462.
- Wong, C. S., Law, K. S., & Wong, P. M. (2004). Development and validation of a forced choice emotional intelligence measure for Chinese respondents in Hong Kong. *Asia Pacific Journal of Management, 21*, 535-559.
- Zigler, E. F., & Bishop-Josef, S. J. (2006). The cognitive child vs. the whole child: Lessons from 40 years of Head Start. In D. G. Singer, R. M. Golinkoff, & K. Hirsh-Pasek (Eds.), *Play = learning: How play motivates and enhances children's cognitive and social-emotional growth* (pp. 15-35). New York, NY: Oxford University Press.
- Zins, J. E., Weissberg, R. P., Wang, M. C., & Walberg, H. J. (Eds.). (2004). *Building academic success on social and emotional learning: What does the research say?* New York, NY: Teachers College Press.

Bios

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John D. Mayer, PhD, is Professor of Psychology at the University of New Hampshire. He has served on the editorial boards of *Psychological Bulletin* and the *Review of General Psychology*, among others. Dr. Mayer received his PhD in psychology at Case Western Reserve University, and was a postdoctoral scholar at Stanford University. Dr. Mayer has published more than 100 articles, books and tests in psychology. His work is focused on personality psychology and its study, including in particular the study of emotional intelligence and of personal intelligence.

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Peter Salovey, PhD, Provost of Yale University, is the Chris Argyris Professor of Psychology. He joined the Yale faculty in 1986 after receiving an A.B. and A.M. from Stanford University and a PhD from Yale. Professor Salovey has authored or edited thirteen books translated into eleven languages and has published more than 350 journal articles and essays, focused primarily on human emotion and health behavior. With John D. Mayer he developed the broad framework called emotional intelligence and for decades has studied the profound impact that measurable emotional skills have on thinking and action. In his research on health behavior, Professor Salovey investigates the effectiveness of health promotion messages in persuading people to change risky behaviors and adapt healthy ones.