The Science of Emotional Intelligence

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ABSTRACT—*This article provides an overview of current research on emotional intelligence. Although it has been defined in many ways, we focus on the four-branch model by Mayer and Salovey (1997), which characterizes emotional intelligence as a set of four related abilities: perceiving, using, understanding, and managing emotions. The theory provides a useful framework for studying individual differences in abilities related to processing emotional information. Despite measurement obstacles, the evidence in favor of emotional intelligence is accumulating. Emotional intelligence predicts success in important domains, among them personal and work relationships.*

KEYWORDS—*emotional intelligence; emotions; social interaction*

In the past decade, emotional intelligence has generated an enormous amount of interest both within and outside the field of psychology. The concept has received considerable media attention, and many readers of this article may have already encountered one or more definitions of emotional intelligence. The present discussion, however, focuses on the scientific study of emotional intelligence rather than on popularizations of the concept.

Mayer and Salovey (1997; see also Salovey & Mayer, 1990) proposed a model of emotional intelligence to address a growing need in psychology for a framework to organize the study of individual differences in abilities related to emotion. This theoretical model motivated the creation of the first ability-based tests of emotional intelligence. Although findings remain preliminary, emotional intelligence has been shown to have an effect on important life outcomes such as forming satisfying personal relationships and achieving success at work. Perhaps most importantly, ability-based tests of emotional intelligence reliably measure skills that are relatively distinct from commonly assessed aspects of personality.

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THE FOUR-BRANCH MODEL OF EMOTIONAL INTELLIGENCE

Emotional intelligence brings together the fields of emotions and intelligence by viewing emotions as useful sources of information that help one to make sense of and navigate the social environment. Salovey and Mayer (1990, p. 189) proposed a formal definition of emotional intelligence as "The ability to monitor one's own and others' feelings, to discriminate among them, and to use this information to guide one's thinking and action." Later this definition was refined and broken down into four proposed abilites that are distinct yet related: perceiving, using, understanding, and managing emotions (Mayer & Salovey, 1997).

The first branch of emotional intelligence, *perceiving emotions*, is the ability to detect and decipher emotions in faces, pictures, voices, and cultural artifacts. It also includes the ability to identify one's own emotions. Perceiving emotions may represent the most basic aspect of emotional intelligence, as it makes all other processing of emotional information possible.

The second branch of emotional intelligence, *using emotions*, is the ability to harness emotions to facilitate various cognitive activities, such as thinking and problem solving. We can illustrate the skills in this branch through a hypothetical scenario. Imagine that you have to complete a difficult and tedious assignment requiring deductive reasoning and attention to detail in a short amount of time; would it be better, as far as completing the task goes, to be in a good mood or in a sad mood? Being in a slightly sad mood helps people conduct careful, methodical work. Conversely, a happy mood can stimulate creative and innovative thinking (e.g., Isen, Johnson, Mertz, & Robinson, 1985). The emotionally intelligent person can capitalize fully upon his or her changing moods in order to best fit the task at hand.

The third branch of emotional intelligence, *understanding emotions*, is the ability to comprehend emotion language and to appreciate complicated relationships among emotions. For

example, understanding emotions encompasses the ability to be sensitive to slight variations between emotions, such as the difference between happy and ecstatic. Furthermore, it includes the ability to recognize and describe how emotions evolve over time, such as how shock can turn into grief.

The fourth branch of emotional intelligence, *managing emotions*, consists of the ability to regulate emotions in both ourselves and in others. Everyone is familiar with times in their lives when they have temporarily, and sometimes embarrassingly, lost control of their emotions. The fourth branch also includes the ability to manage the emotions of others. For example, an emotionally intelligent politician might increase her own anger and use it to deliver a powerful speech in order to arouse righteous anger in others. Therefore, the emotionally intelligent person can harness emotions, even negative ones, and manage them to achieve intended goals.

EMOTIONAL INTELLIGENCE IN CONTEXT

Intrinsic to the four-branch model of emotional intelligence is the idea that these skills cannot exist outside of the social context in which they operate. In order to use these skills, one must be aware of what is considered appropriate behavior by the people with whom one interacts. This point is central to our discussion of how to measure emotional intelligence.

We consider the role of emotional intelligence in personality to be similar to that played by traditional, analytic intelligence. Specifically, emotional intelligence is a set of interrelated skills that allows people to process emotionally relevant information efficiently and accurately (Mayer, Caruso, & Salovey, 1999). Although emotional intelligence correlates to some extent with tests that measure verbal abilities, it overlaps only modestly with standard measures of personality such as those organized by the Big Five personality traits: openess to experience, conscientiousness, extroversion, agreeableness, and neuroticism. Our conceptualization therefore defines emotional intelligence as a set of skills or competenencies rather than personality traits. Whether these skills as a whole operate similarly in every social context is a question requiring further research. It is possible that people may differ in emotional intelligence for different kinds of emotions or that some individuals are better able to harness their emotional intelligence in social or other situations. These sorts of contextual questions require much more investigation.

As noted earlier, one of the primary purposes in proposing a model of emotional intelligence was to provide a framework for investigators exploring individual differences in the processing of emotion-relevant information. In recent years, a number of researchers have made important discoveries suggesting places to look for such differences. For example, positive emotions can temporarily broaden a person's repertoire of thoughts, leading to creative problem solving (Frederickson, 1998). People vary in their abilities to differentiate their emotions; that is, some people can recognize fine-grained distinctions in what they are feeling (e.g., "I feel angry and guilty, and a little bit sad too"), whereas other people can only recognize their feelings in a vague way (e.g., "I feel bad"; Barrett, Gross, Christensen, & Benvenuto, 2001). In addition, sharing traumatic personal experiences can often help people achieve emotional closure, leading to better long-term emotional and physical health (Pennebaker, 1997).

Based on the four-branch model of emotional intelligence, we can interpret Frederickson's work as important to branch two, using emotions. Furthermore, Barrett et al.'s (2001) research on emotional differentiation relates to the third branch of emotional intelligence, understanding emotions. Pennebaker's (1997) findings tie in nicely with the fourth branch, managing emotions. Emotional intelligence provides an organizing heuristic that helps us to understand the relationships among reported findings and guides directions for future research.

MEASURING EMOTIONAL INTELLIGENCE

The first tests of emotional intelligence consisted of self-report scales, which ask people to rate themselves on a number of characteristics (e.g. displaying patience, having good relationships, tolerating stress well) that the authors of such tests believe represent emotional intelligence. However, scores on self-report tests of emotional intelligence such as these are highly correlated with standard personality constructs such as extroversion and neuroticism (Brackett & Mayer, 2003). Such tests raise two difficult questions: whether people are sufficiently aware of their own emotional abilities to report upon them accurately, and whether people answer the questions truthfully instead of reporting in a socially desirable manner. To address these problems, ability-based tests such as the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) were constructed (Mayer, Salovey, & Caruso, 2002).

The MSCEIT is a 40-minute battery that may be completed either on paper or computer. By testing a person's abilities on each of the four branches of emotional intelligence, it generates scores for each of the branches as well as a total score (see Figs. 1–4 for items similar to those on the MSCEIT for each of the four branches). Central to the four-branch model is the idea that emotional intelligence requires attunement to social norms. Therefore, the MSCEIT is scored in a consensus fashion, with higher scores indicating higher overlap between an individual's answers and those provided by a worldwide sample of thousands of respondents. In addition, the MSCEIT can be expert scored, so that the amount of overlap is calculated between an individual's answers and those provided by a group of 21 emotion researchers. Importantly, both methods are reliable and yield similar scores, indicating that both laypeople and experts possess shared social knowledge about emotions (Mayer, Salovey, Caruso, & Sitarenios, 2003).

Fig. 1. Example item similar to those from the *perceiving emotions* branch of the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT).

Creating an assessment battery that successfully tests a construct as broad as emotional intelligence is challenging, but it appears that the MSCEIT is an appropriate starting point. Scores on each of the four branches (perceiving, using, understanding, managing) correlate modestly with one another, and the branch and overall scores are reliable (Mayer et al., 2003). Lopes, Salovey, and Straus (2003) found small positive correlations between scores on the MSCEIT and the Big Five traits of agreeableness and conscientiousness. However, not only does the MSCEIT appear to test emotional abilities rather than personality traits, it also does not correlate with scales that measure a person's likelihood to respond in socially desirable ways.

FINDINGS USING THE MSCEIT

Since the concept first became popular, eager advocates of emotional intelligence have claimed that emotional skills matter in almost all areas of life—from career success to being liked by others. Although many of these claims await empirical test, research using the MSCEIT has corroborated a few of them and has offered some new insights. We have explored the importance of how these skills operate within interpersonal interaction, and clinical researchers have speculated about using the MSCEIT in the assessment of psychopathology. We begin with a study looking at the relationship between emotional intelligence and antisocial behavior.

Emotional intelligence is negatively associated with deviant behavior in male adolescents (Brackett, Mayer, & Warner, 2004). College-aged students were asked to take the MSCEIT, a Big Five personality test, and an array of measures that assessed the frequency of engaging in various behaviors. Males who scored lower on the MSCEIT reported engaging in more recreational drug use and consuming more alcohol. In addition, these participants reported having more unsatisfying relationships with their friends. Even when controlling for the effects of participants' personality and for analytic intelligence, the findings involving emotional intelligence remained significant (this is true also for the other MSCEIT studies discussed in this article).

Lopes et al. (2003) administered the MSCEIT to a sample of college students, along with questionnaires that assessed self-reported satisfaction with social relationships. Participants who scored higher on the MSCEIT were more likely to report having positive relationships with others, including greater perceived support from their parents and fewer negative interactions with their close friends.

A limitation of the two studies described above is that they used the MSCEIT to predict the self-reported quality of social relationships. Lopes et al. (2004), however, examined the relationship between individuals' emotional intelligence and reports of their attributes by their peers. American college students took the MSCEIT and were asked to have two of their close friends rate their personal qualities. The students who scored higher on the MSCEIT received more positive ratings from their friends. The friends also reported that students high in emotional intelligence were more likely to provide them with emotional support in times of need. Emotionally intelligent people may have the capacity to increase favorable reciprocity within a relationship.

What mood(s) might be helpful to feel when meeting in-laws for the very first time?

	Not Useful			Useful	
a) Tension	1	2	3	4	5
b) Surprise	1	2	3	4	5
c) Joy	1	2	3	4	5

Fig. 2. Example item similar to those from the *using emotions* branch of the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT).

Tom felt anxious, and became a bit stressed when he thought about all the work he needed to do. When his supervisor brought him an additional project, he felt ____.

a) Overwhelmed

b) Depressed

c) Ashamed

d) Self Conscious

e) Jittery

Fig. 3. Example item similar to those from the *understanding emotions* branch of the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT).

In another study, German students were asked to keep diaries of their daily social interactions (Lopes et al., 2004). Those students who scored higher on the MSCEIT reported greater success in their social interactions with members of the opposite sex. For example, they were more likely to report that they had come across in a competent or attractive manner and that their opposite-sex partner perceived them as having desirable qualities, such as intelligence and friendliness.

Emotional intelligence may also help people in relationships with their partners and spouses. One study examined the emotional intelligence of 180 college-age couples (Brackett, Cox, Gaines, & Salovey, 2005). They completed the MSCEIT and then answered questions about the quality of their relationships. The couples were classified by how matched they were in emotional intelligence. The couples in which both individuals scored low on the MSCEIT reported the greatest unhappiness with their relationship, as compared to the happiness ratings of the other two groups. The couples in which both partners were emotionally intelligent were very happy. Furthermore, couples in which only one partner had high emotional intelligence tended to fall between the other groups in happiness.

Emotional intelligence also may matter at work. A sample of employees of a Fortune 500 insurance company, who worked in small teams each headed by a supervisor, completed the MSCEIT. All employees were asked to rate each other on the qualities they displayed at work, such as handling stress and conflict well and displaying leadership potential. Supervisors were also asked to rate their employees. Employees with higher scores on the MSCEIT were rated by their colleagues as easier to deal with and as more responsible for creating a positive work environment. Their supervisors rated them as more interpersonally sensitive, more tolerant of stress, more sociable, and having greater potential for leadership. Moreover, higher scores on the MSCEIT were related to higher salary and more promotions. Despite its small sample, the study shows exciting new evidence that emotional intelligence may in fact play an important role in career success (Lopes, Grewal, Kadis, Gall, & Salovey, in press).

FUTURE DIRECTIONS

We have discussed the four-branch model of emotional intelligence and its utility as a guiding framework for research on emotions. In addition, we have described a recently developed ability-based test of emotional intelligence, the MSCEIT, and its value as a tool with which to assess a person's emotion-related abilities. We view the MSCEIT as an early step in the assessment of emotional intelligence. New interactive technologies should

1. Debbie just came back from vacation. She was feeling peaceful and content. How well would each action preserve her mood?

Action 1: She started to make a list of things at home that she needed to do.

Very Ineffective..1.....2.....3.....4.....5..Very Effective

Action 2: She began thinking about where and when she would go on her next vacation.

Very Ineffective..1.....2.....3.....4.....5..Very Effective

Action 3: She decided it was best to ignore the feeling since it wouldn't last anyway.

Very Ineffective..1.....2.....3.....4.....5..Very Effective

Fig. 4. Example item similar to those from the *managing emotions* branch of the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT).

lead to innovative and valid ways of assessing people's abilities, especially fluid emotional intelligence in online situations.

This area of research also can benefit from a focus on several theoretical challenges. We lack a thorough understanding of the underlying mechanisms by which emotion-related abilities affect relationships. Research is needed to understand the motivational underpinnings of using certain skills depending on the particular interpersonal context. One of the biggest challenges is figuring out how to examine the influence of such contextual factors on the application and functionality of these skills. It seems likely that individual differences in temperament, which affect levels of arousal, might influence the application of emotion-related skills. Furthermore, some have argued that much emotion-related knowledge and subsequent behavior operate outside of conscious awareness, an idea that has yet to receive much exploration.

Finally, future researchers will need to address more fully the potential impact—positive and negative—of instituting emotional-intelligence training programs. Although such programs appear to offer the possibilities of tackling major social problems, from obesity to school violence, we must caution researchers that the same problems that face any application of basic science to real-world settings also apply to emotional intelligence. The curricula of programs aimed at increasing emotional intelligence should be empirically-based. Rather than a panacea for all human problems, emotional intelligence is a set of abilities that can be applied in prosocial or antisocial ways. Simply developing the skills of emotional intelligence may not prove fruitful unless we also implement interventions that address the contextual and motivational factors affecting the use of these skills. A careful application of the scientific basis of emotional intelligence holds promise in affecting the lives of schoolchildren, workers, and family members.

Recommended Reading

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