Emotion
2014, Vol. 14, No. 1, 64–73

1528-3542/14/$12.00 DOI: 10.1037/a0034392

Emotional Intelligence Predicts Success in Medical School

Nele Libbrecht, Filip Lievens, and Bernd Carette
Ghent University

Stéphane Côté
University of Toronto

Accumulating evidence suggests that effective communication and interpersonal sensitivity during interactions between doctors and patients impact therapeutic outcomes. There is an important need to identify predictors of these behaviors, because traditional tests used in medical admissions offer limited predictions of "bedside manners" in medical practice. This study examined whether emotional intelligence would predict the performance of 367 medical students in medical school courses on communication and interpersonal sensitivity. One of the dimensions of emotional intelligence, the ability to regulate emotions, predicted performance in courses on communication and interpersonal sensitivity over the next 3 years of medical school, over and above cognitive ability and conscientiousness. Emotional intelligence did not predict performance on courses on medical subject domains. The results suggest that medical schools may better predict who will communicate effectively and show interpersonal sensitivity if they include measures of emotional intelligence in their admission systems.

Keywords: emotional intelligence, interpersonal performance, predictive validity, academic performance, medical school

> He communicated easily. He described the strong sense of connection he had felt with the patients at the free clinic at which he had volunteered. While I wasn't yet sure what a great physician was, I had an intuitive sense he would become one. Yet the decision was "His science grades aren't strong enough. Reject." (Barr, 2010, p. 678)

The quote above hints that how medical schools make acceptance decisions does not match our intuitions about what makes a great physician. Currently, acceptance decisions in medical schools are largely based on scores on the Medical College Admission Test (MCAT), a test that assesses cognitive abilities related to technical aspects of medical work, including critical thinking, writing skills, and knowledge of scientific concepts. Despite meta-analytic evidence supporting the use of the MCAT (Donnon, Paolucci, & Violato, 2007), medical schools have come to the realization that this test provides little information about who will communicate effectively and show interpersonal sensitivity in medical practice—behaviors that are associated with favorable patient outcomes. As a result, it has become a priority for the medical profession to find reliable and systematic ways to identify potential physicians who will exhibit these interpersonal behaviors (Barr, 2010; Kaplan, Satterfield, & Kington, 2012; Lievens, 2013; Powis, 2010). Here, we investigate whether emotional intelligence (EI), a set of abilities concerned with processing emotions and emotional information (Mayer, Roberts, & Barsade, 2008), predicts these behaviors, as reflected in performance in classes on communication and interpersonal sensitivity with patients in the first 3 years of medical study. We further test whether EI predicts performance in these classes over and above cognitive factors and conscientiousness.

Background

The Facets of Academic Performance

Academic institutions increasingly consider student performance to be broader than traditional intellectual achievement. In particular, conceptions of academic performance now include how well students navigate interpersonal encounters (Oswald, Schmitt, Kim, Ramsay, & Gillespie, 2004; Schmitt et al., 2009). Even medical schools, which teach content that is very technical, are increasingly acknowledging that interpersonal skills and personal characteristics (also known as soft skills or 21st century skills) represent core dimensions of academic performance (Barr, 2010; Kaplan et al., 2012; Lievens, 2013; Lievens & Sackett, 2012; Powis, 2010). This shift in the conceptualization of academic performance has been shown in past research. On the basis of a content analysis of mission statements and educational objectives described on the Web sites of colleges and universities, Oswald et al. (2004) identified 12 major academic performance dimensions representing three broad types of behaviors: intellectual behavior, interpersonal behavior, and intrapersonal behavior.

In line with a multidimensional conceptualization of academic performance, we also differentiated the criterion of medical academic performance into different facets. Specifically, we differentiated this criterion in two dimensions: intellectual academic performance and interpersonal academic performance. Intellectual

This article was published Online First November 11, 2013.

Nele Libbrecht, Filip Lievens, and Bernd Carette, Department of Personnel Management and Work and Organizational Psychology, Ghent University, Ghent, Belgium; Stéphane Côté, Joseph L. Rotman School of Management and Department of Psychology, University of Toronto, Toronto, Ontario, Canada.

Correspondence concerning this article should be addressed to Filip Lievens, Department of Personnel Management and Work and Organizational Psychology, Ghent University, Henri Dunantlaan 2, 9000 Ghent, Belgium. E-mail: filip.lievens@ugent.be

academic performance parallels traditional conceptions of academic performance and refers to behaviors such as gaining knowledge, learning, and mastering general principles. Conversely, interpersonal academic performance refers to behaviors such as communicating well with others and being aware of the social dynamics of a situation (Oswald et al., 2004). We did not examine the third intrapersonal dimension of academic performance identified by Oswald et al., because the subject matter experts who sorted the courses that participants took did not identify any of these courses as fitting the intrapersonal dimension (cf. Lievens & Sackett, 2012).

Although sometimes neglected, the interpersonal facet of academic performance appears prominently in the definition of professional competence in medical practice offered by Epstein and Hundert (2002): "the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and community being served" (p. 226). Moreover, the findings of several studies support the importance of these characteristics for therapeutic outcomes; these effects are often called "context effects." A systematic review of randomized controlled trials revealed the importance of context effects for various health outcomes (Di Blasi et al., 2001). For instance, patients reported significantly less pain and anxiety when practitioners delivered painkillers in a reassuring, warm, and friendly manner, compared with when practitioners adopted a nonemotional delivery (Gryll & Katahn, 1978). In another study, patients with tonsillitis recovered faster when practitioners were friendly (i.e., encouraged questions, framed the prognosis favorably), relative to when practitioners were more serious (Olsson, Olsson, & Tibblin, 1989). This research suggests that context effects occur over and above the effect of specific medical treatments and, thus, that it is important to identify predictors of context effects.

Emotional Intelligence

EI may predict performance on the interpersonal aspects of medical work. Researchers have proposed different conceptual models of EI. In this study, we adopted the ability approach to conceptualizing EI because it is the approach that is the most conceptually consistent with how intelligence is traditionally defined. Ability models propose that EI concerns "the ability to carry out accurate reasoning about emotions and the ability to use emotions and emotional knowledge to enhance thought" (Mayer et al., 2008, p. 511). Intelligence represents individual variation in how well individuals can accomplish tasks in a specific domain, such as language or logic (Carroll, 1993; Côté, 2010). Ability approaches to EI are consistent with that definition, in that they define EI as individual differences in the ability to accomplish certain tasks in the domain of emotions, such as accurately identifying the reason why a person feels an emotion, and effectively modifying an emotion (Côté & Miners, 2006; Mayer & Salovey, 1997). Under this approach, EI is assessed using performance-based tests wherein individuals indicate the appropriate reaction to emotion-related problems or identify facial expressions, and answers are evaluated against predetermined scoring criteria (Freudenthaler & Neubauer, 2005).

EI as a Predictor of Interpersonal Academic Performance

We propose that EI predicts interpersonal academic performance via several complementary mechanisms. Equipped with the ability *to understand the causes of other people's emotions* (Salovey & Mayer, 1990), emotionally intelligent individuals should be best able to take the perspective of their interaction partners and empathize with them, because they know why they feel the emotions that they do. In turn, emotionally intelligent individuals should be able to provide better social support and develop close interpersonal bonds. For example, medical students who understand that patients are anxious because of a particular procedure should be able to support patients effectively by reassuring them that the procedure will not have unanticipated negative consequences. In contrast, medical students with lower EI who attribute the anxiety to an incorrect cause, for example, by believing that a patient is chronically anxious, should have difficulty providing support, and this should impede performance on the interpersonal aspects of doctor-patient communications.

In addition, the *ability to manage emotions* effectively should promote effective social interaction between medical professionals and patients (Wong & Law, 2002). Some emotion regulation strategies strengthen social bonds, while other strategies create friction between individuals (Grandey, 2003; Gross & John, 2003). EI should help individuals choose the strategies that best facilitate social interactions, such as providing support to others, and forgo strategies that have no impact or even a negative impact on social interactions, such as avoidance (Matthews et al., 2006). In addition, emotionally intelligent medical students should implement emotion regulation strategies more effectively than their counterparts.

Consistent with this reasoning, past studies have found associations between EI and high quality social relationships (Brackett, Rivers, Shiffman, Lerner, & Salovey, 2006; Lopes et al., 2004; Lopes, Salovey, Côté, & Beers, 2005). In small groups, members with high EI tend to become central in social networks (Miners, 2008). In the workplace, the EI of employees is correlated with the quality of their relationships with their supervisors, as rated by the supervisors (Côté & Miners, 2006). These theoretical arguments and supporting empirical evidence suggest that EI may predict interpersonal academic performance. Thus, we predicted:

> *Hypothesis 1:* Emotional intelligence will be positively related to interpersonal academic performance.

Cognitive Ability and Conscientiousness as Predictors of Intellectual Academic Performance

Cognitive ability and conscientiousness have traditionally shown strong relations with the cognitive component of intellectual academic performance. In a meta-analysis, Kuncel, Hezlett, and Ones (2001) showed that (a) undergraduate GPA and (b) the Graduate Record Examinations (GRE), a set of standardized tests of verbal, quantitative, and analytic abilities as well as specific subject area knowledge, predict graduate school performance. In addition, past research has found that the trait of conscientiousness, the disposition to be hardworking, thorough, and persistent, is the trait that most strongly predicts intellectual academic per-

formance (Noftle & Robins, 2007; Poropat, 2009). Lievens, Ones, and Dilchert (2009) found that conscientiousness was the only trait (among the Big Five personality traits) that consistently predicted intellectual performance throughout medical school.

Compared with cognitive ability and conscientiousness, EI may play a less important role in intellectual academic performance, because this facet of performance relies less on emotional processing. Although EI is not solely relevant in social situations (for instance, students with higher EI can better regulate anxiety caused by examinations and other forms of assessment; MacCann, Fogarty, Zeidner, & Roberts, 2011), the ability to understand the source of emotions and to regulate emotions effectively should be relatively less helpful to solve intellectual problems, such as finding interrelations between facts, ideas, and theories. In short, we predicted:

Hypothesis 2: Cognitive ability and conscientiousness will be positively related to intellectual academic performance.

Incremental validity. Finally, we aimed to explore whether EI improves predictions above and beyond other potential predictors of performance in medical school (Barchard, 2003). It is pivotal to examine the validity of different predictors over and above each other, a facet of validity typically referred to as incremental validity (Schmidt & Hunter, 1998). From a utility standpoint, the use of additional predictors is only of value if they explain variance in the criterion that is not already explained by other existing predictors. Conscientiousness and cognitive ability have been frequently examined as competing predictors in research on EI (Joseph & Newman, 2010; Van Rooy & Viswesvaran, 2004). Therefore, we examined the incremental validity of EI over these two predictors.

We expected that EI would explain variance in interpersonal academic performance that is not explained by conscientiousness and cognitive ability. Although conscientiousness and cognitive ability have been associated with academic performance (Kuncel et al., 2001; Poropat, 2009), there remains a large portion of unexplained variance. Moreover, the dimensions of EI constitute considerably different attributes of individuals than cognitive ability and conscientiousness. Whereas cognitive ability concerns variation in intellectual processes such as memory, mathematical skill, and verbal knowledge, EI concerns processes such as understanding the sources of emotions and effectively modifying aspects of emotions. In addition, whereas conscientiousness, being a personality trait, represents what people typically do, EI represents individuals' maximum potential (Côté & Miners, 2006; Mayer & Salovey, 1997). Given that the abilities contained in models of EI are fundamentally different types of individual differences than cognitive ability or conscientiousness, EI may predict some of the yet unexplained variation performance on emotionally loaded tasks and responsibilities, such as interacting with others efficiently. On the basis of these arguments, we formulated a third hypothesis:

Hypothesis 3: Emotional intelligence will explain incremental variance in interpersonal academic performance over cognitive ability and conscientiousness.

Method

Sample

The sample consisted of 367 undergraduate medical students (mean age = 20 years, *SD* = .84; 39% men; 99% Whites) from a large European university who were followed up consecutively each year for 3 years. The students participated for partial completion of a course requirement and, thus, the response rate was 100%. All of the students had successfully passed an admission exam in Medical and Dental Studies.

Procedure

We administered a Web-based test battery in large personal computer-equipped rooms to all medical students, in groups of ~40. Students completed an informed consent form and a battery of tests that included demographic questions and measures of personality traits and EI. The measure of cognitive ability was obtained from official records. The measures of the criteria (intellectual and interpersonal academic performance) were obtained from official records.

Predictor Measures

Emotional intelligence. We measured EI with the Situational Test of Emotional Understanding (STEU) and the Situational Test of Emotion Management (STEM) (MacCann & Roberts, 2008). These instruments are based on the situational judgment test paradigm. In situational judgment tests, examinees are presented with realistic, job-related situations and are typically asked to indicate what should be done to handle each situation effectively (McDaniel, Hartman, Whetzel, & Grubb, 2007; Weekley, Ployhart, & Holtz, 2006). The promising validity of situational judgment tests (McDaniel et al., 2007; McDaniel, Morgeson, Finnegan, Campion, & Braverman, 2001) and the possibility of varying the content of situational judgment tests to capture a variety of performance domains (such as teamwork and leadership) have made them a popular measurement approach in psychology (Christian, Edwards, & Bradley, 2010; Weekley & Ployhart, 2006). By changing the content of the situations to represent scenarios with basic emotional situations and asking respondents to indicate the most appropriate response in these situations, situational judgment tests can also be developed for the domain of EI.

The STEU and the STEM assess two main branches of EI: emotional understanding and emotional management (Mayer & Salovey, 1997). Specifically, the STEU assesses the ability to identify and understand the emotions that are most likely to be elicited by specific situations. It consists of 42 multiple-choice items that each describes a different situation. Respondents identified which of five emotions is most likely to be elicited by the situation. The test developers determined correct answers a priori by consulting research studies based on Roseman's appraisal theory (Roseman, 2001), a theory that describes the characteristics of the events that cause each of several different emotions. A sample item is: *Kevin has been working at his current job for a few years. Out of the blue, he finds that he will receive a promotion. Kevin is most likely to feel? (a) pride, (b) relief, (c) joy, (d) hope, or (e) sadness.* The correct answer is joy.

The STEM assesses the ability to effectively manage emotional situations, by choosing the most appropriate emotion regulation strategies. The 30 items of the STEM each describe a different emotional situation. Participants selected the most effective course of action to manage both the emotions the person is feeling and the problems they face in the situation. The options were presented in multiple-choice format. The test developers determined the scoring key by collecting the judgments of experts, including psychologists, counselors, and researchers. A sample item is: *Alan helps Trudy, a peer he works with occasionally, with a difficult task. Trudy complains that Alan's work isn't very good, and Alan responds that Trudy should be grateful he is doing her a favor. They argue. What action would be the most effective for Alan? (a) Apologize to Trudy, (b) stop helping Trudy and don't help her again, (c) try harder to help appropriately, or (d) diffuse the argument by asking for advice.* The best answer is (d).

The validity of these measures is supported by a growing number of studies (Austin, 2010; Libbrecht & Lievens, 2012; MacCann, 2010; MacCann & Roberts, 2008). It has been shown that the STEU and STEM correlate with each other and load on a higher-order EI factor, supporting their convergent validity. Furthermore, the measures of EI correlate with other performance-based EI measures such as the Mayer–Salovey–Caruso Emotional Intelligence Test (Mayer, Salovey, & Caruso, 2002), further supporting their convergent validity. In support of their discriminant validity, past findings show that these measures do not correlate highly with measures of personality traits and fluid cognitive ability, and correlate with verbal ability to a moderate extent. Finally, in terms criterion-related validity, recent research reported that the STEM correlates significantly with different components of well-being (Burrus et al., 2012).

In terms of reliability, MacCann and Roberts (2008) reported internal consistencies ranging between .43 and .71 for the STEU and between .61 and .72 for the STEM. In our sample, the internal consistencies were .40 and .57 for the STEU and STEM, respectively. However, psychometricians have suggested that test–retest reliability is a better index of the reliability of situational judgment tests than internal consistency (Whetzel & McDaniel, 2009) because these tests are multidimensional (McDaniel Cabrera & Nguyen, 2001; Motowidlo, Dunnette, & Carter, 1990). To evaluate test–retest reliability, in a pilot study, we administered the STEU and STEM on two occasions separated by an interval of 2 weeks to 32 undergraduate psychology students (24 women) who are not part of the sample in the current study. In this pilot study, the test–retest reliabilities were .72 for the STEU and .85 for the STEM.

In line with the hierarchical view of EI in which a general EI factor is divided into more specific factors (Mayer et al., 2008; Salovey & Mayer, 1990) and with empirical evidence supporting this view (MacCann, 2010), we created a composite score for EI by standardizing and averaging the scores on the STEU and STEM. There was a significant correlation of .22 between the STEU and STEM, which was similar to the correlation reported in previous studies (e.g., $r = .29$; Austin, 2010). We conducted the focal analyses using the EI composite. We then conducted subsidiary analyses with the separate dimensions of EI.

Cognitive ability. Kuncel and colleagues (2001) showed in a meta-analysis that a composite of general measures (e.g., GRE verbal and numerical) combined with specific GRE subject-matter tests provides the highest validity in predicting academic performance. To provide the strongest test of the incremental validity of EI, we used a measure of cognitive ability that consisted of an IQ test (50 items, each with five response alternatives) plus four subject-matter (science knowledge) tests (40 questions related to biology, chemistry, mathematics, and physics, each with four response alternatives). These scores were retrieved from archival records of the Medical and Dental Studies admission exam in Flanders at least 2 months before the participants entered Medical School. Prior research demonstrated the satisfactory reliability and predictive validity of this test for a medical student population (Lievens, Buyse, & Sackett, 2005). In light of test security, we cannot mention the source of this test nor can we present sample items.[1]

Conscientiousness. We measured the Big Five personality traits (i.e., extraversion, agreeableness, conscientiousness, neuroticism, and openness) with 45 items from the International Personality Item Pool (IPIP; Goldberg, 1999). For the purposes of this study, only the conscientiousness measure was used in the analyses. Conscientiousness was measured with nine self-descriptive items. Respondents indicated the degree to which each item is an accurate description of them on a scale ranging from 1 (*very inaccurate*) to 5 (*very accurate*). The internal consistency reliability of the scale's scores was .82.

Criterion Measures

We retrieved archival data on students' scores on all courses in their first, second, and third year of medical study. These grades were retrieved after the students finished each respective year. In most European countries, including the country where this investigation took place, students' performance on courses is graded on a scale from 0 to 20, with higher scores indicating better grades. We standardized students' grades within each academic year to avoid potential distortion effects caused by differences in year. As noted above, we distinguished between two facets of academic performance: intellectual and interpersonal performance (Lievens et al., 2005; Lievens & Sackett, 2012; Oswald et al., 2004; Schmitt et al., 2009).

Interpersonal academic performance. In each of the first 3 years of the curriculum, students took one course with a substantial interpersonal component. In each of these three courses, students gained insight into the specificity of doctor-patient communication. Students learned skills related to active listening, empathy, and communication. The interpersonal courses consisted of experiential exercises and exams such as role-plays with simulated patients. The range of interpersonal skills taught during these courses remained similar over the years, with the level of complexity of the exercises increasing. For instance, in the first year, exercises might deal with a disgruntled patient, whereas in the third year a case might pertain to ethical dilemmas or involve multiple parties.

Interpersonal academic performance was assessed by averaging the grades in each of these courses across years. Students took these courses seriously because they had to pass all of their courses to proceed to the next year of medical school. Researchers have

[1] Interested readers may contact the corresponding author for more information.

advocated temporal stability as one of the best estimates of the reliability of grades (Kuncel et al., 2001). Therefore, to estimate the reliability of interpersonal academic performance, we computed the correlation among the course grades of students who took the course exam twice in the last 10 years ($n = 576$), and then corrected this correlation for indirect range restriction because it was based only on students who failed the course the first time. The uncorrected reliability of the interpersonal GPA score was .67 (corrected reliability = .70). We also computed the internal consistency reliability of interpersonal academic performance. The internal consistency reliability was .42. We applied the Spearman–Brown formula to estimate the internal consistency of interpersonal GPA if there had been as many interpersonal courses as intellectual courses (i.e., 18). This corrected internal consistency estimate was .81, suggesting that it might have been relatively low because it was based on only three courses.

Intellectual academic performance. Most of the first-, second-, and third-year courses taken by the participants dealt with various medical subject domains. On average, students took six of those courses per year. These courses focused on acquiring and using medical information and knowledge. They specifically covered topics such as physiology, microbiology, cell biochemistry, and immunology. Intellectual academic performance was assessed by averaging the grades in 18 courses across the 3 years. The uncorrected reliability of intellectual academic performance, calculated using the same procedures as above, was .79 (corrected reliability = .89). The internal consistency reliability was .91, an estimate that was high, presumably because it was based on 18 grades.

Association between interpersonal and academic performance. Although the medical subject content in the interpersonal courses was secondary to the skills of communicating with patients, asking questions, dealing with their complaints, and so forth, these courses were not void of medical subject matter. The overlap was evidenced by a positive correlation between the two facets of academic performance, $r = .53$, $p < .001$. Confirmatory factor analyses indicated that a two-factor model that separates intellectual and interpersonal academic performance as two different yet intercorrelated latent factors provided a good fit of the data, $\chi^2(34) = 182.95$, *CFI* = .97, *SRMR* = .032, and *RMSEA* = .067. The fit of this two-factor model was significantly better than the fit of a one-factor model ($\chi^2(35) = 234.62$, *CFI* = .95, *SRMR* = .039, and *RMSEA* = .077), $\Delta\chi^2(1) = 51.67$, $p < .001$.

Results

Correlational Analyses

The means, standard deviations, and range restriction corrected correlations between the predictors and criteria are presented in Table 1. The number of individuals who completed the tests of cognitive ability was larger than the number of participants in this study, because both those who were accepted and those who were rejected from medical schools completed the cognitive ability tests. This implied that the cognitive ability scores were range restricted. Thus, we used the multivariate range restriction formulas of Ree, Carretta, Earles, and Albert (1994) to make the appropriate corrections to our correlation matrix. This corrected correlation matrix served as input for all analyses.

We predicted in Hypothesis 1 that EI would correlate positively with interpersonal academic performance. Inspection of Table 1 reveals that the correlation was positive ($r = .21$, $p < .001$). Therefore, Hypothesis 1 was supported. The two individual differences that consistently predicted intellectual academic performance (cognitive ability and conscientiousness) in past research were not significantly correlated with interpersonal academic performance.

In Hypothesis 2, we predicted that cognitive ability and conscientiousness would be related to intellectual academic performance. Table 1 shows that both cognitive ability and conscientiousness were correlated with intellectual academic performance. Thus, Hypothesis 2 was supported. EI was not significantly related to intellectual academic performance.

Incremental Validity Analyses

In Hypothesis 3, we predicted that EI would predict incremental variance in interpersonal academic performance above and beyond cognitive ability and conscientiousness. To test this hypothesis, we conducted a hierarchical regression analysis with interpersonal academic performance as the criterion. In the first block, we entered cognitive ability and conscientiousness. In the second block, we entered EI. We compared the results of this analysis with the results of an additional hierarchical regression analysis with intellectual academic performance as the criterion.

As shown in Table 2, EI showed incremental validity for predicting interpersonal academic performance over conscientiousness and cognitive ability, $\Delta R^2 = .04$, $F(1, 363) = 16.80$, $p <$

Table 1
Means, Standard Deviations, Correlations Among Study Variables, and Reliabilities (N = *367*)

	M	*SD*	1	2	3	4	5	6	7
1. Cognitive ability	6.10	.79	(.81)	−.10	.01	−.08	−.04	.27***	.12
2. Conscientiousness	3.40	.62	−.07	(.82)	−.03	.12*	.06	.25***	.22***
3. Emotion understanding ability	27.64	3.40	−.01	−.03	(.72)	.22***	.70***	.05	.10
4. Emotion regulation ability	141.37	4.73	−.08	.11*	.22***	(.85)	.86***	.08	.23***
5. Emotional intelligence	84.50	3.21	−.07	.07	.70***	.86***	(.79)	.08	.21***
6. Intellectual academic performance	14.29	1.28	.22***	.26***	.05	.08	.08	—	.53***
7. Interpersonal academic performance	13.37	1.94	.08	.23***	.10	.23***	.22***	.52***	—

Note. Range restriction corrected correlations are above the diagonal; uncorrected correlations are below the diagonal. Although all analyses were conducted on standardized intellectual and interpersonal academic performance scores, we present the mean and standard deviations of their raw scores. Internal consistency reliabilities are reported in parentheses on the diagonal. For emotional intelligence the test–retest reliability is reported.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 2
Summary of Hierarchical Regression Analyses of Predictors on Grade Point Average Broken Down by Curriculum Type (N = *367*)

Predictor	Interpersonal academic performance					Intellectual academic performance				
	b	*t*	*p*	R^2	ΔR^2	b	*t*	*p*	R^2	ΔR^2
Step 1										
Cognitive ability	.15	3.08	.00**	.069***	.069**	.30	6.23	.00***	.150***	.150***
Conscientiousness	.22	4.45	.00***			.27	5.64	.00***		
Step 2										
Emotional Intelligence	.20	4.10	.00***	.11***	.041***	.08	1.66	.10	.157***	.006

Note. Parameter estimates are for final step, not entry.
* $p < .05$. ** $p < .01$. *** $p < .001$.

.001, supporting Hypothesis 3. We found similar results when we repeated the analysis with the IQ test scores instead of the composite cognitive ability scores that also included the science knowledge test scores. This additional analysis, however, offered a weaker test of the incremental validity of EI, because the composite cognitive ability scores account for a larger proportion of the variance in the criteria (Kuncel et al., 2001). EI did not explain any incremental variance in intellectual academic performance beyond the variance explained by cognitive ability and conscientiousness (see Table 2).

Subsidiary Analysis

To provide more insights about how the separate facets of EI predicted interpersonal academic performance, we conducted an additional analysis. This analysis was identical to the hierarchical regression analysis of interpersonal academic performance described above, except that we included the abilities to understand and to regulate emotions separately rather than including them as one composite. In this analysis, the ability to regulate emotion explained unique variance in interpersonal performance ($b = .20$, $p < .001$), but the ability to understand emotion did not ($b = .06$, $p = .23$).

In another subsidiary analysis, we examined whether EI could also predict incremental variance over all of the Big Five traits and cognitive ability. Results were identical to the ones presented above. That is, EI showed incremental validity for predicting interpersonal academic performance over personality traits and cognitive ability, $\Delta R^2 = .04$, $p < .001$. Again, this effect was driven by emotion regulation ability ($b = .18$, $p < .001$), rather than emotion understanding ability ($b = .06$, $p = .27$).

Discussion

Given the importance of admission to medical studies for candidates, universities, and society in general, the search for supplemental predictors of which physicians will communicate effectively and show interpersonal sensitivity with patients is an important priority for researchers and policymakers. This study provides evidence-based information as input for this discussion. Specifically, this study shows that EI could be included in the set of constructs measured at the time of medical admission to predict how well medical students will perform in interpersonal courses on "bedside manners." The results revealed that EI predicts interpersonal academic performance, even after controlling for cognitive ability and conscientiousness. EI was not related to intellectual academic performance.

When we separated the two facets of EI, the ability to regulate emotion predicted interpersonal academic performance over and above conscientiousness, cognitive ability, and the other emotional ability, but the ability to understand emotion did not. We did not expect that only one of the dimensions of EI, rather than both dimensions, would predict interpersonal academic performance. One possible explanation is that the ability to understand emotions is a more distal predictor of performance than the ability to regulate emotions. The ability to understand emotions refers to a set of knowledge structures about emotional states that enable us to appraise an emotional situation and influence how we can respond to and regulate that emotion. Hence, individuals may most effectively regulate their emotions after they have identified the events that triggered the emotions (Joseph & Newman, 2010; Mayer & Salovey, 1997). If the ability to understand emotions is a more distal predictor of performance, then its effect size should be smaller, and it should be less likely to be significant than the ability to regulate emotions.

It is also possible that the ability to regulate emotions is more important to navigate social encounters and, thus, to perform well in courses on interactions between physicians and patients than the ability to understand emotions. This possibility is consistent with past findings that the ability to regulate emotions in particular is more strongly associated with the quality of social relationships than the other dimensions of EI (Lopes et al., 2004; Lopes et al., 2005). It is possible that the ability to understand emotions, by contrast, is more important for other types of emotional challenges, such as being aware of how emotions influence decisions (Buontempo & Brockner, 2008; Yip & Côté, 2013). Future research should improve our understanding of when and why the abilities contained in models of EI predict specific facets of performance better than others.

Implications

By identifying when EI predicts academic performance, this research makes several contributions. The results have important implications for how EI is applied in educational settings. Selection systems for college admissions currently emphasize cognitive ability and specific subject knowledge (Oswald et al., 2004). Emotional abilities are not formally included in selection systems, and they are often largely ignored because emotional ability tests are not used in the selection process. Our results suggest that this

current approach may be too narrow, especially for medical schools that choose to value interpersonal performance in their curriculum. Medical school applicants with high scores on general mental ability measures can be expected to do well on the intellectual courses. The findings of our study reveal that these general mental ability scores, however, offer little information about how applicants will perform on the interpersonal facets of physicians' work. The findings imply that to select applicants who are expected to do well on both the intellectual and the interpersonal aspects of medical education, selection systems should include tests of both cognitive and emotional abilities.

Regarding the above recommendation, it is important to keep in mind the primacy of the criterion. Upon finding that EI does not predict intellectual academic performance, one reaction might be to call for a broadening of the curriculum to include interpersonal courses, thus making it likely that EI would show validity. We would argue against this, as it lets an interest in a predictor drive the choice of the criteria. Assuming a clear decision on the part of universities to make a strategic choice to differentiate themselves from one another by choosing to either emphasize or de-emphasize an interpersonal skills orientation, the choice of relevant predictors should follow.

The findings of this research also contribute to our understanding how EI is related to academic performance. Past research concerning the relationship between EI and academic performance has been mixed. Several studies have revealed a positive association between EI and academic performance (Barchard, 2003; MacCann & Roberts, 2008), even after controlling for personality and cognitive ability (Di Fabio & Palazzeschi, 2009). Some studies found small correlations ($r = .14$ in Brackett, Mayer, & Warner, 2004). In other studies, EI was not significantly correlated with academic performance (Bastian, Burns, & Nettelbeck, 2005; O'Connor & Little, 2003) and did not explain variance in grades beyond personality and cognitive ability (Amelang & Steinmayr, 2006; Rode et al., 2008; Rossen & Kranzler, 2009). Inconsistent results such as these have fueled critiques of the construct of EI (e.g., Barrett, Miguel, Tan, & Hurd, 2001; Landy, 2005; Murphy, 2006).

The present research suggests that the inconsistent results can be reconciled by paying closer attention to the criterion that is predicted. One explanation for the conflicting results about EI and academic performance is that prior studies have often not paid sufficient attention to the criterion construct that is predicted by EI. The construct of EI encompasses abilities that are specific to processing emotional information, such as understanding the sources of emotions and modifying aspects of the emotion response. The logic of matching predictors and criteria (Hogan & Holland, 2003; Lievens et al., 2005; Sackett & Lievens, 2008) suggests that EI should predict aspects of performance in which processing emotional information is important to success (Joseph & Newman, 2010; Wong & Law, 2002). For aspects of performance that depend less on processing emotional information, EI should be a weaker predictor. From a predictor-criterion matching viewpoint, the inconsistent associations between EI and performance do not necessarily reveal weaknesses in the construct of EI. Rather, they reveal potentially theoretically sensible patterns of associations.

The results of the present study also provide support for the theoretical differentiation between EI abilities and two other individual difference characteristics that relate to performance, cognitive ability and conscientiousness. Considerable criticism has been directed at EI because of its potential overlap with extant individual differences (Landy, 2005; Schulte, Ree, & Carretta, 2004). However, important theoretical distinctions exist between the constructs (Côté & Miners, 2006; Mayer, Salovey, Caruso, & Sitarenios, 2001). Emotional abilities differ from cognitive abilities in their relative degree of focus on emotional versus cognitive mental processes (Côté & Miners, 2006; Mayer & Salovey, 1997). In addition, emotional abilities differ from conscientiousness because the former consists of maximum performance, and the latter consists of typical behavior across situations and over time (Côté & Miners, 2006; Mayer & Salovey, 1997). The results of the analyses of incremental validity in the present study supported these theoretical arguments. If the content of EI overlapped considerably with cognitive ability and conscientiousness, then EI would not have explained variance in interpersonal academic performance over and above these extant individual differences.

Finally, this study has implications for the measurement of emotional abilities, an area that has provided challenges to researchers. The measures have been criticized in particular for their scoring system, length, and availability (Conte, 2005; MacCann, Matthews, Zeidner, & Roberts, 2003; Spector & Johnson, 2006). The situational judgment tests used in this study help address these problems. The scoring systems were developed using standard procedures for situational judgment tests (Weekley et al., 2006). These tests are freely available from the test developers (MacCann & Roberts, 2008). Further, they are relatively easy to administer because they are of similar length as widely used cognitive ability measures.

Caveats and Future Directions

Some limitations should be acknowledged. A first possible limitation is that this study was conducted in a single European country, which might influence the generalizability of our findings. There are some differences between the admission practices in this European country and those in other continents. For example, in the studied European country, the admission exam is centralized and government-run, and the level of selectivity (30% passing rate) is generally less stringent than in the United States. Despite these differences, there are many similarities between medical school in the studied European country and medical school in the United States. Most important, in both countries, there is a trend to broaden medical school curricula with an increased focus on interpersonal skills (Blumberg, 2003; Teutsch, 2003). Furthermore, policymakers in both countries have advocated supplementing cognitive predictors with situational judgment tests for making admission decisions.

Second, in the present study, the criterion consisted of test-based performance across the first 3 years of medical school. Future research is needed to examine our hypotheses in the context of further medical education and ultimately actual physician performance. We expect that the differentiating effect of EI in predicting interpersonal versus intellectual performance will increase throughout medical school and practice, because interpersonal work with actual patients becomes more important in the later years of the curriculum.

Third, this study was conducted in a low-stakes research context. We do not know whether the results could replicate in an operational high-stakes context wherein candidates are highly motivated and coached to score highly on the EI measure. Although this remains an open question for future research, an important aspect of this study is that EI was conceptualized and measured as a set of abilities. Participants took tests of EI with answers judged to be more or less correct by experts. We did not use an approach to measure EI in which participants evaluate their own levels of ability. It is generally known that performance (or ability) tests are more difficult to fake and coach than self-report measures.

Future studies should examine the mechanisms by which students with higher EI perform better on interpersonal tasks. For example, emotionally intelligent students may select more appropriate strategies to manage their emotions (Matthews et al., 2006). By suppressing emotions such as anger and amplifying emotions such as sympathy, these individuals may create better impressions during interpersonal encounters. Emotionally intelligent students may also develop strong social networks that provide resources such as advice and support that help them become effective in interpersonal settings (Miners, 2008).

In summary, our results show that EI (and particularly the ability to regulate emotions) serves as a useful predictor of how well medical students perform in courses focused on "bedside manners." Medical schools that use tests of EI to complement existing test batteries should make better decisions about who will successfully perform the complete set of intellectual and interpersonal tasks that are required by effective physicians.

References

Amelang, M., & Steinmayr, R. (2006). Is there a validity increment for tests of emotional intelligence in explaining the variance of performance criteria? *Intelligence, 34,* 459–468. doi:10.1016/j.intell.2006.03.003

Austin, E. J. (2010). Measurement of ability emotional intelligence: Results for two new tests. *British Journal of Psychology, 101,* 563–578. doi:10.1348/000712609X474370

Barchard, K. A. (2003). Does emotional intelligence assist in the prediction of academic success? *Educational and Psychological Measurement, 63,* 840–858. doi:10.1177/0013164403251333

Barr, D. A. (2010). Science as superstition: Selecting medical students. *Lancet, 376,* 678–679. doi:10.1016/S0140-6736(10)61325-6

Barrett, G. V., Miguel, R. M., Tan, J. A., & Hurd, J. M. (2001, April). Emotional intelligence: The Madison Avenue approach to science and professional practice. In R. C. Page (Chair), *Emotional intelligence: Applications and issues in organizations*. Symposium conducted at the 16th Annual Conference of the Society for Industrial and Organizational Psychology, San Diego, CA.

Bastian, V. A., Burns, N. R., & Nettelbeck, T. (2005). Emotional intelligence predicts life skills, but not as well as personality and cognitive abilities. *Personality and Individual Differences, 39,* 1135–1145. doi:10.1016/j.paid.2005.04.006

Blumberg, P. (2003). Multidimensional outcome considerations in assessing the efficacy of medical educational programs. *Teaching and Learning in Medicine, 15,* 210–214. doi:10.1207/S15328015TLM1503_10

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. doi:10.1016/S0191-8869(03)00236-8

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. doi:10.1037/0022-3514.91.4.780

Buontempo, G., & Brockner, J. (2008). Emotional intelligence and the ease of recall judgment bias: The mediating effect of private self-focused attention. *Journal of Applied Social Psychology, 38,* 159–172. doi:10.1111/j.1559-1816.2008.00300.x

Burrus, J., Betancourt, A., Holtzman, S., Minsky, J., MacCann, C., & Roberts, R. D. (2012). Emotional intelligence relates to well-being: Evidence from the situational judgment test of emotional management. *Applied Psychology: Health and Well-Being, 4,* 151–166. doi:10.1111/j.1758-0854.2012.01066.x

Carroll, J. B. (1993). *Human cognitive abilities: A survey of factor-analytic studies*. New York, NY: Cambridge University Press. doi:10.1017/CBO9780511571312

Christian, M. S., Edwards, B. D., & Bradley, J. C. (2010). Situational judgment tests: Constructs assessed and a meta-analysis of their criterion-related validities. *Personnel Psychology, 63,* 83–117. doi:10.1111/j.1744-6570.2009.01163.x

Conte, J. (2005). A review and critique of emotional intelligence measures. *Journal of Organizational Behavior, 26,* 433–440. doi:10.1002/job.319

Côté, S. (2010). Taking the "intelligence" in emotional intelligence seriously. *Industrial and Organizational Psychology: Perspectives on Science and Practice, 3,* 127–130. doi:10.1111/j.1754-9434.2010.01211.x

Côté, S., & Miners, C. (2006). Emotional intelligence, cognitive intelligence, and job performance. *Administrative Science Quarterly, 51,* 1–28.

Di Blasi, Z., Harkness, E., Ernst, E., Georgiou, A., & Kleijnen, J. (2001). Influence of context effects on health outcomes: A systematic review. *Lancet, 357,* 757–762. doi:10.1016/S0140-6736(00)04169-6

Di Fabio, A., & Palazzeschi, L. (2009). An in-depth look at scholastic success: Fluid intelligence, personality traits or emotional intelligence? *Personality and Individual Differences, 46,* 581–585. doi:10.1016/j.paid.2008.12.012

Donnon, T., Paolucci, E. O., & Violato, C. (2007). The predictive validity of the MCAT for medical school performance and medical board licensing examinations: A meta-analysis of the published research. *Academic Medicine, 82,* 100–106. doi:10.1097/01.ACM.0000249878.25186.b7

Epstein, R. M., & Hundert, E. M. (2002). Defining and assessing professional competence. *The Journal of the American Medical Association, 287,* 226–235. doi:10.1001/jama.287.2.226

Freudenthaler, H. H., & Neubauer, A. C. (2005). Emotional intelligence: The convergent and discriminant validities of intra- and interpersonal emotional abilities. *Personality and Individual Differences, 39,* 569–579. doi:10.1016/j.paid.2005.02.004

Goldberg, L. R. (1999). A broad-bandwidth, public domain, personality inventory measuring the lower-level facets of several five-factor models. In I. Mervielde, I. Deary, F. De Fruyt, & F. Ostendorf (Eds.), *Personality psychology in Europe* (pp. 7–28). Tilburg, Netherlands: Tilburg University Press.

Grandey, A. A. (2003). When "the show must go on": Surface acting and deep acting as determinants of emotional exhaustion and peer-rated service delivery. *Academy of Management Journal, 46,* 86–96. doi:10.2307/30040678

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85,* 348–362. doi:10.1037/0022-3514.85.2.348

Gryll, S. L., & Katahn, M. (1978). Situational factors contributing to the placebos effect. *Psychopharmacology, 57,* 253–261. doi:10.1007/BF00426747

Hogan, J., & Holland, B. (2003). Using theory to evaluate personality and job-performance relations: A socioanalytic perspective. *Journal of Applied Psychology, 88,* 100–112. doi:10.1037/0021-9010.88.1.100

Joseph, D. L., & Newman, D. A. (2010). Emotional Intelligence: An integrative meta-analysis and cascading model. *Journal of Applied Psychology, 95,* 54–78. doi:10.1037/a0017286

Kaplan, R. M., Satterfield, J. M., & Kington, R. S. (2012). Building a better physician: The case for the new MCAT. *The New England Journal of Medicine, 366,* 1265–1268. doi:10.1056/NEJMp1113274

Kuncel, N. R., Hezlett, S. A., & Ones, D. S. (2001). A comprehensive meta-analysis of the predictive validity of the graduate record examinations: Implications for graduate student selection and performance. *Psychological Bulletin, 127,* 162–181. doi:10.1037/0033-2909.127.1.162

Landy, F. J. (2005). Some historical and scientific issues related to research on emotional intelligence. *Journal of Organizational Behavior, 26,* 411–424. doi:10.1002/job.317

Libbrecht, N., & Lievens, F. (2012). Validity evidence for the situational judgment test paradigm in emotional intelligence measurement. *International Journal of Psychology, 47,* 438–447. doi:10.1080/00207594.2012.682063

Lievens, F. (2013). Adjusting medical school admission: Assessing interpersonal skills using situational judgement tests. *Medical Education, 47,* 182–189. doi:10.1111/medu.12089

Lievens, F., Buyse, T., & Sackett, P. R. (2005). The operational validity of a video-based situational judgment test for medical college admissions: Illustrating the importance of matching predictor and criterion construct domains. *Journal of Applied Psychology, 90,* 442–452. doi:10.1037/0021-9010.90.3.442

Lievens, F., Ones, D. S., & Dilchert, S. (2009). Personality scale validities increase throughout medical school. *Journal of Applied Psychology, 94,* 1514–1535. doi:10.1037/a0016137

Lievens, F., & Sackett, P. (2012). The validity of interpersonal skills assessment via situational judgment tests for predicting academic success and job performance. *Journal of Applied Psychology, 97,* 460–468. doi:10.1037/a0025741

Lopes, P. N., Brackett, M. A., Nezlek, J. B., Schütz, A., Sellin, I., & Salovey, P. (2004). Emotional intelligence and social interaction. *Personality and Social Psychology Bulletin, 30,* 1018–1034. doi:10.1177/0146167204264762

Lopes, P. N., Salovey, P., Côté, S., & Beers, M. (2005). Emotion regulation abilities and the quality of social interaction. *Emotion, 5,* 113–118. doi:10.1037/1528-3542.5.1.113

MacCann, C. (2010). Further examination of emotional intelligence as a standard intelligence: A latent variable analysis of fluid intelligence, crystallized intelligence, and emotional intelligence. *Personality and Individual Differences, 49,* 490–496. doi:10.1016/j.paid.2010.05.010

MacCann, C., Fogarty, G. J., Zeidner, M., & Roberts, R. D. (2011). Coping mediates the relationship between emotional intelligence (EI) and academic achievement. *Contemporary Educational Psychology, 36,* 60–70. doi:10.1016/j.cedpsych.2010.11.002

MacCann, C., Matthews, G., Zeidner, M., & Roberts, R. D. (2003). Psychological assessment of emotional intelligence: A review of self-report and performance-based testing. *The International Journal of Organizational Analysis, 11,* 247–274. doi:10.1108/eb028975

MacCann, C., & Roberts, R. D. (2008). New paradigms for assessing emotional intelligence: Theory and data. *Emotion, 8,* 540–551. doi:10.1037/a0012746

Matthews, G., Emo, A. K., Funke, G., Zeidner, M., Roberts, R. D., Costa, P. T., & Schulze, R. (2006). Emotional intelligence, personality, and task-induced stress. *Journal of Experimental Psychology: Applied, 12,* 96–107. doi:10.1037/1076-898X.12.2.96

Mayer, J. D., Roberts, R. D., & Barsade, S. (2008). Human abilities: Emotional intelligence. *Annual Review of Psychology, 59,* 507–536. doi:10.1146/annurev.psych.59.103006.093646

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. (2002). *The Mayer, Salovey, and Caruso Emotional Intelligence Test: Technical manual*. Toronto, Canada: Multi-Health Systems.

Mayer, J. D., Salovey, P., Caruso, D., & Sitarenios, G. (2001). Emotional intelligence as a standard intelligence. *Emotion, 1,* 232–242. doi:10.1037/1528-3542.1.3.232

McDaniel, M. A., Hartman, N. S., Whetzel, D. L., & Grubb, W. L. (2007). Situational judgment tests, response instructions, and validity: A meta-analysis. *Personnel Psychology, 60,* 63–91. doi:10.1111/j.1744-6570.2007.00065.x

McDaniel, M. A., Morgeson, F. P., Finnegan, E. B., Campion, M. A., & Braverman, E. P. (2001). Use of situational judgment tests to predict job performance: A clarification of the literature. *Journal of Applied Psychology, 86,* 730–740. doi:10.1037/0021-9010.86.4.730

McDaniel Cabrera, M. A., & Nguyen, N. T. (2001). Situational judgment tests: A review of practice and constructs assessed. *International Journal of Selection and Assessment, 9,* 103–113. doi:10.1111/1468-2389.00167

Miners, C. T. H. (2008). *It is who you know and what you know: An examination of the relations among emotional intelligence, social network centrality, and performance*. Unpublished dissertation, Rotman School of Management, University of Toronto, Toronto, Canada.

Motowidlo, S. J., Dunnette, M. D., & Carter, G. W. (1990). An alternative selection procedure: The low-fidelity simulation. *Journal of Applied Psychology, 75,* 640–647. doi:10.1037/0021-9010.75.6.640

Murphy, K. R. (2006). *A critique of emotional intelligence: What are the problems and how can they be fixed?* Mahwah, NJ: Erlbaum.

Noftle, E. E., & Robins, R. W. (2007). Personality predictors of academic outcomes: Big Five correlates of GPA and SAT scores. *Journal of Personality and Social Psychology, 93,* 116–130. doi:10.1037/0022-3514.93.1.116

O'Connor, R. M., & Little, I. S. (2003). Revisiting the predictive validity of emotional intelligence: Self-report versus ability-based measures. *Personality and Individual Differences, 35,* 1893–1902. doi:10.1016/S0191-8869(03)00038-2

Olsson, B., Olsson, B., & Tibblin, G. (1989). Effect of patients expectations on recovery from acute tonsillitis. *Family Practice, 6,* 188–192. doi:10.1093/fampra/6.3.188

Oswald, F. L., Schmitt, N., Kim, B. H., Ramsay, L. J., & Gillespie, M. A. (2004). Developing a biodata measure and situational judgment inventory as predictors of college student performance. *Journal of Applied Psychology, 89,* 187–207. doi:10.1037/0021-9010.89.2.187

Poropat, A. E. (2009). A meta-analysis of the five-factor model of personality and academic performance. *Psychological Bulletin, 135,* 322–338. doi:10.1037/a0014996

Powis, D. (2010). Improving the selection of medical students. *British Medical Journal, 340,* c708. doi:10.1136/bmj.c708

Ree, M. J., Carretta, T. R., Earles, J. A., & Albert, W. (1994). Sign changes when correcting for range restriction: A note on Pearson's and Lawley's selection formulas. *Journal of Applied Psychology, 79,* 298–301. doi:10.1037/0021-9010.79.2.298

Rode, J. C., Mooney, C. H., Arthaud–Day, M. L., Near, J. P., Rubin, R. S., Baldwin, T. T., & Bommer, W. H. (2008). An examination of the structural, discriminant, nomological, and incremental predictive validity of the MSCEIT (c) V2.0. *Intelligence, 36,* 350–366. doi:10.1016/j.intell.2007.07.002

Roseman, I. J. (2001). A model of appraisal in the emotion system: Integrating theory, research, and applications. In K. R. Scherer & A. Schorr (Eds.), *Appraisal processes in emotion: Theory, methods, research* (pp. 68–91). New York, NY: Oxford University Press.

Rossen, E., & Kranzler, J. H. (2009). Incremental validity of the Mayer–Salovey–Caruso Emotional Intelligence Test Version 2.0 (MSCEIT)

after controlling for personality and intelligence. *Journal of Research in Personality, 43,* 60–65. doi:10.1016/j.jrp.2008.12.002

Sackett, P. R., & Lievens, F. (2008). Personnel selection. *Annual Review of Psychology, 59,* 419–450. doi:10.1146/annurev.psych.59.103006.093716

Salovey, P., & Mayer, J. D. (1989-1990). Emotional intelligence. *Imagination, Cognition and Personality, 9,* 185–211. doi:10.2190/DUGG-P24E-52WK-6CDG

Schmidt, F. L., & Hunter, J. E. (1998). The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 85 years of research findings. *Psychological Bulletin, 124,* 262–274. doi:10.1037/0033-2909.124.2.262

Schmitt, N., Keeney, J., Oswald, F. L., Pleskac, T. J., Billington, A. Q., Sinha, R., & Zorzie, M. (2009). Prediction of 4-year college student performance using cognitive and noncognitive predictors and the impact on demographic status of admitted students. *Journal of Applied Psychology, 94,* 1479–1497. doi:10.1037/a0016810

Schulte, M. J., Ree, M. J., & Carretta, T. R. (2004). Emotional intelligence: Not much more than g and personality. *Personality and Individual Differences, 37,* 1059–1068. doi:10.1016/j.paid.2003.11.014

Spector, P. E., & Johnson, H. M. (2006). Improving the definition, measurement, and application of emotional intelligence. In K. R. Murphy (Ed.), *A critique of emotional intelligence: What are the problems and how can they be fixed* (pp. 325–344)? Mahwah, NJ: Erlbaum, Publishers.

Teutsch, C. (2003). Patient-doctor communication. *Medical Clinics of North America, 87,* 1115–1145. doi:10.1016/S0025-7125(03)00066-X

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. doi:10.1016/S0001-8791(03)00076-9

Weekley, J. A., Ployhart, R. E., & Holtz, B. C. (2006). On the development of situational judgment tests: Issues in item development, scaling, and scoring. In J. Weekley & R. E. Ployhart (Eds.), *Situational judgment tests: Theory, measurement and application* (pp. 157–182). Mahwah, NJ: Erlbaum.

Whetzel, D. L., & McDaniel, M. A. (2009). Situational judgment tests: An overview of current research. *Human Resource Management Review, 19,* 188–202. doi:10.1016/j.hrmr.2009.03.007

Wong, C. S., & Law, K. S. (2002). The effects of leader and follower emotional intelligence on performance and attitude: An exploratory study. *The Leadership Quarterly, 13,* 243–274. doi:10.1016/S1048-9843(02)00099-1

Yip, J. A., & Côté, S. (2013). The emotionally intelligent decision maker: Emotion-understanding ability reduces the effect of incidental anxiety on risk-taking. *Psychological Science, 24,* 48–55. doi:10.1177/0956797612450031

Received July 19, 2012
Revision received July 17, 2013
Accepted August 12, 2013 ■