Does Emotional Intelligence Assist in the Prediction of Academic Success?

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DOES EMOTIONAL INTELLIGENCE ASSIST IN THE PREDICTION OF ACADEMIC SUCCESS?

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Some authors have claimed that emotional intelligence predicts success at work, at school, and in relationships, as well as or better than IQ. Little research exists to support or refute this claim at present. In this study, the ability of emotional intelligence to predict academic achievement was examined in a sample of undergraduate psychology students, using year-end grades as the criterion. The predictive validity of emotional intelligence was compared with the predictive validity of traditional cognitive abilities and the Big Five dimensions of personality. In addition, the incremental predictive validity of each of these three domains was assessed. In this setting, only some measures of Emotional Intelligence predicted academic success, and none of these measures showed incremental predictive validity for academic success over and above cognitive and personality variables. It may be that the overlap between many emotional intelligence measures and traditional measures of intelligence and personality limits their incremental predictive validity in this context.

Keywords: *emotional intelligence; validity; personality; cognitive abilities*

A great deal of excitement has surrounded the possible predictive ability of emotional intelligence (EI). *TIME* (1995) magazine claimed that "Emotional Intelligence may be the best predictor of success in life, redefining what it means to be smart," and Goleman (1995) claimed that EI can predict success at home, at work, and at school, as well as or better than IQ. At present, little evidence exists to either support or refute these claims.

What is EI? Unfortunately, no simple answer to this question exists, because EI has been defined in different ways. Some researchers, such as

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Mayer, Salovey, and Caruso (1999), define EI as a cognitive ability: the ability to understand and reason about emotions. Others define EI more broadly, and also include personality variables such as persistence and optimism (Goleman, 1995), the tendency to make decisions based on feelings rather than logic (Tett, Wang, Gribler, & Martinez, 1997), and/or the tendency to express one's emotions nonverbally (Tett et al., 1997). In addition, the concept of EI overlaps with constructs such as social intelligence (the ability to understand others and act wisely in social situations), empathy (the ability to understand others' feelings and the tendency to experience others' emotions vicariously), alexithymia (difficulty understanding and describing feelings), and emotion regulation (the ability to regulate ones' emotions as desired). Indeed, tests that were originally designed to measure these four constructs are now often used as measures of EI.

Given the range of variables that fall within the EI domain, it seems likely that at least some of them will be able to predict success, but it also seems likely that not all of them will be able to predict all types of success. Extensive research will therefore be needed to pinpoint the most useful predictors for each possible type of success.

In the realm of academic success, only three studies have examined the predictive validity of EI per se, and all three used self-report measures. In the first of these studies, Swart (1996) found significant differences in total scores on the EQ-i (Bar-On, 1997) between academically successful and unsuccessful university students, using 1st-year grades as the criterion. In the second study, Bar-On (1997) found significant differences in self-reported success in the 1st year of military academy between successful, average, and unsuccessful students on all 15 of the EQ-i subscales. In neither of these studies was any measure of effect size given. Schutte et al. (1998) found a correlation of .32 ($p < .01$) between a 33-item self-report measure of EI and 1st-year university grades. Unfortunately, none of these three studies determined if EI were able to predict academic success when differences in intellectual ability or personality were also taken into account. Additional research can be found in the literature on social intelligence, but the results have been mixed. Some studies have shown that social intelligence predicts academic success (e.g., Gough, 1993; Tenopyr, 1967), but other studies have failed to find any relation (e.g., McKelvie, 1986; Osipow & Walsh, 1973). Few of these studies have attempted to control for differences in intellectual ability, and none has controlled for differences in personality.

Cognitive abilities can predict approximately 20% of the variance in life success (Goleman, 1995), corresponding to a correlation of about .45. The evidence we have so far (Schutte et al., 1998) suggests that EI can predict approximately 10% of the variance in academic success. Furthermore, even if EI could predict 20% of the variance in academic success, this would not be very useful to us if it predicted the same 20% as traditional cognitive abilities

and personality variables. EI will only be useful if it allows us to improve our prediction of success. No published studies have addressed this issue.

In this article, I compare the predictive validity of EI with that of traditional cognitive and personality variables in the realm of academic success. In addition, I examine the incremental predictive validity of each of these three domains to determine if EI can improve the prediction of academic success when these better known variables have already been taken into account.

Method

Participants

In exchange for course credit, 150 upper division undergraduate students (94 women) volunteered for this study. They averaged 21.5 years, and most identified themselves as White (44%) or Asian (43%). All participants spoke English as their first language or had spoken English for at least 10 years, and they rated themselves as very comfortable reading and writing English.

Predictor Measures

Cognitive domain. A battery of 12 timed cognitive tests (see Table 1) was used to measure four different first-stratum cognitive abilities (e.g., see Carroll, 1993): verbal ability, verbal closure (the ability to recognize words in difficult circumstances), inductive reasoning, and visualization. A composite for each of these cognitive abilities was calculated as the mean *z* score of the three tests designed to measure it.

For each of the 12 tests, the coefficient alpha was calculated separately for men and women and then averaged (see Table 1). The internal consistencies of the composite scores were calculated using the standard theorems for the reliability of a linear combination (Horst, 1966, pp. 280-282). Confidence intervals (95%) for the reliability coefficients were also computed, using the method in Feldt (1965), and illustrated in Fan and Thompson (2001). From Table 1, the reader will note that individual tests sometimes had low levels of internal consistency. However, in further analyses, only the four composite scores were used, and each of these had acceptable internal consistencies.

Personality domain. Goldberg (1999a, 1999b) created 10-item public-domain measures of constructs similar to the 30 Revised NEO Personality Inventory (NEO-PI-R) facets (Costa & McCrae, 1992) of the Five-Factor Model of personality. Twenty-three of these scales were selected for inclusion based on their apparent relevance to the construct of EI. Scales were selected based on their relevance to EI to ensure that the incremental predictive validity of the EI measures is not overstated in this research. For each

Table 1
Cognitive Measures

Measure	Source	Internal Consistency
Verbal closure		
Rearranged words	Barchard[a]	.78 (.72, .83)
Hidden words	French Kit[b]	.74 (.67, .80)
Incomplete words	French Kit	.65 (.56, .73)
Verbal closure		.83 (.79, .87)
Verbal ability		
Advanced Vocabulary Test I	French Kit	.53 (.41, .63)
Inventive opposites	Thurstone[c]	.72 (.65, .78)
Reading I	Thurstone	.67 (.59, .74)
Verbal ability		.87 (.84, .90)
Inductive reasoning		
Letter sets	French Kit	.61 (.51, .70)
Figure classification	French Kit	.90 (.87, .92)
Number series	Thurstone	.73 (.66, .79)
Inductive reasoning		.84 (.80, .87)
Visualization		
Form board	French Kit	.61 (.51, .70)
Paper folding	French Kit	.71 (.64, .77)
Surface development	French Kit	.83 (.79, .87)
Visualization		.83 (.79, .87)

Note. Shortened versions were used for most of these tests. The 95% confidence intervals for the population internal consistencies (Feldt, 1965) are given in parentheses after the sample values obtained. Precise formulas for confidence intervals for the reliability of composite scores do not exist; the approximate intervals given here were based on Feldt's formula.
a. Created by Kim Barchard, modeled after the Scrambled Words Test from the French Kit.
b. Ekstrom, French, and Harman (1976).
c. Thurstone (1934).

scale, those 4 items with the highest positive factor loadings and those 4 items with the highest negative factor loadings were selected, and participants completed these 8-item scales. Composite scores for each dimension were calculated as the mean *z* score of the component scales. For each of the 23 scales, the coefficient alpha was calculated separately for men and women and then averaged (see Table 2). The internal consistencies of the composite scores were calculated using the standard theorems for the reliability of a linear combination (Horst, 1966, pp. 280-282).

EI domain. Because EI is a relatively new construct, only a few measures have been designed to measure it. Therefore, when looking for measures of different aspects of EI, measures in the related areas of social intelligence, empathy, alexithymia, and emotion regulation were also considered. I attempted to include measures from a variety of sources, and to cover a variety of EI concepts. In the end, 31 measures of EI were included. Often,

Table 2
The International Personality Item Pool (IPIP) Measures of the 30 Revised NEO Personality Inventory (NEO-PI-R) Constructs

Facet	Internal Consistency of 10-Item Scale in Goldberg (1999b)	Internal Consistency of 8-Item Scale in This Study
O1: Imagination	.83	.76 (.70, .81)
O2: Artistic interest	.84	.73 (.66, .79)
O3: Emotionality	.81	.63 (.53, .71)
O4: Adventurousness	.77	.71 (.63, .78)
O5: Intellect	.86	.81 (.76, .85)
O6: Liberalism	.86	
Openness		.89 (.86, .91)
C1: Self-efficacy	.78	.74 (.67, .80)
C2: Orderliness	.82	
C3: Dutifulness	.71	.65 (.56, .73)
C4: Achievement-striving	.78	.82 (.77, .86)
C5: Self-discipline	.85	.88 (.85, .91)
C6: Cautiousness	.76	.65 (.56, .73)
Conscientiousness		.91 (.89, .93)
E1: Friendliness	.87	.90 (.87, .92)
E2: Gregariousness	.79	.87 (.84, .90)
E3: Assertiveness	.84	.77 (.71, .82)
E4: Activity level	.71	
E5: Excitement-seeking	.78	
E6: Cheerfulness	.81	.70 (.62, .77)
Extraversion		.93 (.91. 95)
A1: Trust	.82	
A2: Morality	.75	.69 (.61, .76)
A3: Altruism	.77	.77 (.71, .82)
A4: Cooperation	.73	.67 (.58, .74)
A5: Modesty	.77	
A6: Sympathy	.75	.69 (.61, .76)
Agreeableness		.89 (.86, .91)
N1: Anxiety	.83	.82 (.77, .86)
N2: Anger	.88	.87 (.84, .90)
N3: Depression	.88	.88 (.85, .91)
N4: Self-consciousness	.80	
N5: Immoderation	.77	.66 (.57, .74)
N6: Vulnerability	.82	.81 (.76, .85)
Neuroticism		.94 (.93, .95)

Note. Not all facet scales were used in this study. The 95% confidence intervals for the population internal consistencies (Feldt, 1965) are given in parentheses after the sample values obtained. Precise formulas for confidence intervals for the reliability of composite scores do not exist; the approximate intervals given here were based on Feldt's formula.

shortened versions of the tests were used, or only some subscales from a particular measure were included. These measures are described below.

For each measure, the coefficient alpha was calculated separately for men and women and was then averaged (see Table 3). The reader will notice that

three of the EI measures had very low internal consistencies: the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) L Analogies subscale (.38), Tett's Emotional Intelligence scale (TEIS) Emotional Appropriateness subscale (.37), and the O'Sullivan and Guilford Social Intelligence Tests (OGSI) Expression Group Test (.20). However, many of the individual EI measures and the total scores on the MSCEIT had quite acceptable levels of internal consistency.

MSCEIT subscales. The MSCEIT Research Version 1.1 (Mayer, Salovey, et al., 1999) is a maximum-performance test of EI based on a view of EI as a cognitive ability. The 12 subtests of the MSCEIT are organized into four areas. The Blends, Progressions, Transitions, and Analogies subscales were designed to measure emotional understanding. The Synesthesia, Facilitation, and Sensation Translations subscales were designed to measure emotional integration—one's ability to integrate one's thinking about emotions with one's thinking about physical sensations. The Faces, Landscapes, and Designs subscales were designed to measure emotion perception. Finally, the Emotion Management and Emotions in Relationships subscales were designed to measure emotional management. In total, the MSCEIT Version 1.1 has 294 items.

The MSCEIT uses a procedure known as consensus scoring: For each item, participants receive a score equal to the proportion of the norm group who selected that same response option. Thus, if 27% of the norm group answered A to Question 12, then a respondent who selected A for Item 12 would receive a score of .27 for that item.

The MSCEIT uses a proprietary scoring key, and therefore I cannot calculate the internal consistencies for the MSCEIT subscales for my data. The internal consistencies reported in Table 3 are those given by Mayer, Salovey, Caruso, and Sitarenios (2002) and were based on samples of at least 1,131 participants. All other internal consistencies reported in Table 3 were calculated specifically for my data.

Levels of Emotional Awareness scale (LEAS). The LEAS (Lane, Quinlan, Schwartz, Walker, & Zeitlin, 1990) consists of 20 emotionally evocative interpersonal situations, and asks participants to describe the emotional responses of the self and the other person involved. Responses are scored based on structural criteria, so that higher scores indicate greater differentiation and integration of emotion-related constructs. A 5-item version of the test was used in this research.

In this study, each protocol was independently scored by two research assistants, and disagreements were resolved. The interrater reliability of this procedure was assessed using a subsample of 40 participants, by comparing scores given by one pair of markers with scores given by another pair of

Table 3
Internal Consistencies of Emotional Intelligence Measures

Measures and Subscales	Designed to Measure	Type of Measure	Internal Consistency
MSCEIT total scores	Emotional intelligence	MP	.93
MSCEIT C blends	Emotional understanding	MP	.52
MSCEIT D progressions	Emotional understanding	MP	.54
MSCEIT H transitions	Emotional understanding	MP	.50
MSCEIT L analogies	Emotional understanding	MP	.38
LEAS, 5-item version	Emotional understanding	MP open-ended	.57 (.45, .75)
TEIS emotional appropriateness	Emotional understanding	MP-SR mixture	.37 (.20, .52)
TAS-20 difficulty describing feelings	Alexithymia	SR	.83 (.78, .87)
TAS-20 difficulty identifying feelings	Alexithymia	SR	.80 (.74, .85)
MSCEIT B synesthesia	Emotional integration	MP	.75
MSCEIT G facilitation	Emotional integration	MP	.77
MSCEIT L sensation translation	Emotional integration	MP	.66
MSCEIT A faces	Perception of emotions in others	MP	.80
TEIS recognizing emotion in others	Perception of emotions in others	SR	.82 (.77, .86)
MSCEIT F landscapes	Perception of emotions in objects	MP	.86
MSCEIT J designs	Perception of emotions in objects	MP	.84
OGSI expression grouping	Social intelligence	MP	.20 (–.02, .39)
OGSI cartoon predictions	Social intelligence	MP	.46 (.31, .59)
OGSI missing cartoons	Social intelligence	MP	.57 (.45, .67)
OGSI social translations	Social intelligence	MP	.71 (.63, .78)
MSCEIT I emotion management	Managing emotions in self	MP	.70
TMMS repair	Managing emotions in self	SR	.85 (.81, .88)
TEIS regulation of emotion in the self	Managing emotions in self	SR	.85 (.81, .88)
MSCEIT E emotions in relationships	Managing emotions in others	MP	.79
TEIS regulation of emotion in others	Managing emotions in others	SR	.81 (.76, .85)
TMMS attention	Attending to emotions	SR	.83 (.78, .87)
TEIS flexible planning	Emotion-based decision making	SR	.81 (.76, .85)
IRI empathic concern	Empathic concern	SR	.75 (.68, .81)
TEIS empathy	Responsive distress	SR	.85 (.81, .88)
QSE positive sharing	Responsive joy	SR	.77 (.71, .82)
Positive Expressivity scale	Positive expressivity	SR	.75 (.68, .81)
Negative Expressivity scale	Negative expressivity	SR	.71 (.63, .78)

Note. MSCEIT = Mayer-Salovey-Caruso Emotional Intelligence Test; LEAS = Levels of Emotional Awareness scale; TEIS = Tett's Emotional Intelligence scale; TAS = Toronto Alexithymia scale; OGSI = O'Sullivan and Guilford Social Intelligence Tests; TMMS = Trait Meta-Mood scale; IRI = Interpersonal Reactivity Index; QSE = Quick Scale of Empathy; MP = maximal performance; SR = self-report. The 95% confidence intervals for the population internal consistencies (Feldt, 1965) are given in parentheses after the sample values obtained in this study.

markers. The average correlation among the three different pairs of markers was .96.

Toronto Alexithymia scale (TAS-20). The TAS-20 (Bagby, Parker, & Taylor, 1994; Bagby, Taylor, & Parker, 1994) is a Likert-type measure of alexithymia. The 7-item Difficulty Identifying Feelings subscale measures the ability to identify one's emotions, whereas the 5-item Difficulty Describing Feelings subscale assesses the ability to verbally describe these emotions to other people. For both subscales, the scoring was reversed, so that high scores represent the ability to understand emotions.

TEIS. The TEIS (Tett et al., 1997) is a multidimensional self-report measure of EI. Six of the TEIS subscales were used: Emotional Appropriateness (the ability to differentiate between similar emotions); Recognition of Emotion in Others; Regulation of Emotion in the Self; Regulation of Emotion in Others; Flexible Planning (a preference to base life decisions on emotions rather than logic); and Empathy (being concerned with and affected by others feelings). Each of these subscales consists of 12 Likert-type items, with half of the items reverse-scored.

Interpretation of the TEIS Emotional Appropriateness subscale is not entirely clear. For each item, one end of the Likert-type scale is considered to be an appropriate emotional reaction; the other, inappropriate. People may obtain low scores because they do not understand their emotions (maximal performance) or because they have unusual emotional reactions (self-report). Therefore, this scale is considered a mixture of maximum-performance and self-report.

OGSI. The OGSI tests (O'Sullivan & Guilford, 1976) are four tests designed to measure behavioral cognition: Expression Grouping, Missing Cartoons, Social Translations, and Cartoon Predictions. These tests were designed to measure the ability to understand behavioral classes, systems, transformations, and implications, respectively. Each of these tests has two separately timed parts, and only the first part of each was used in my research.

Trait Meta-Mood scale (TMMS). The TMMS (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995) is a self-report measure of empathy. The 11-item Attention subscale assesses "people's tendency to attend to their moods and emotions" (p. 128). The 6-item Repair subscale measures the ability to regulate one's own emotions.

Interpersonal Reactivity Index (IRI). The IRI (Davis, 1980, 1983) is a Likert-type self-report measure of empathy. The 7-item Empathic Concern subscale measures the tendency to feel concern or sympathy for those who are less fortunate than oneself.

Quick Scale of Empathy (QSE). The QSE (Caruso & Mayer, 1999) is a Likert-type measure of empathy. The 5-item Positive Sharing subscale appears to measure the tendency to experience positive emotions when people around you do.

Positive Expressivity scale (PES). The PES (Barchard, 2001, 2002) is a 10-item Likert-type measure of the tendency to express positive emotions.

Negative Expressivity scale (NES). The NES (Barchard, 2001, 2002) is a 10-item Likert-type measure of the tendency to express negative emotions.

Criterion Measure

Each participant gave the researcher explicit permission to access their year-end grades through their official university records. These grades are the mean percentage obtained in all courses attempted over the academic year (September to April). It should be noted that participants varied in their year of study and in the courses they attempted.

Procedure

Each participant completed the 31 EI measures, the 12 cognitive ability measures, and the 23 personality scales over a period of approximately 2 months. The self-report measures were administered using two separate take-home packages, and the maximum-performance measures were administered in supervised testing sessions. Each participant completed two testing sessions, the first session lasting approximately 1 hour and the second session lasting approximately 1.5 hours. In total, it took participants 3.5 to 4 hours to complete all of the measures. Participants completed the measures in the following order: personality measures, self-report EI measures, cognitive ability measures, and maximum-performance EI measures.

Data Analysis

In the first stage of the analysis, I examined the ability of each domain to predict academic success and improve the prediction of academic success, using multiple regressions with all available measures. Thus, each domain was considered as a whole.

Second, I examined the measures within each domain to determine which were the most useful in predicting academic success. Two different statistics were used: (a) the correlation between each predictor and academic success, and (b) the increase in the squared multiple correlation coefficient. This second statistic assesses incremental predictive validity and was calculated in

two stages. First, measures from the other two domains were entered into the regression equation. Second, each measure from the domain of interest was entered into the equation and the increase in R^2 was noted. In addition, because all 12 subscales from the MSCEIT were used in this study, the predictive validity and incremental predictive validity of the MSCEIT total scores were also assessed.

When assessing the incremental predictive validity of a measure from one of these three domains, one might include in the multiple regression equations either all of the measures from the other two domains or only a subset of them. To ensure that the incremental predictive validity of a domain is not overstated, it is important that all of the useful predictors from the other two domains are included. For this reason, one might choose to include all of the measures from the other two domains. This approach leads to conservative estimates of incremental predictive validity because many irrelevant predictors from the other two domains are likely to be included. On the other hand, to ensure that the incremental predictive validity is not understated, one should include only those measures from the other two domains that are related to the criterion of interest. For this reason, one might include very few measures from the other two domains. One technique would be to include only those measures from the other two domains whose bivariate correlations with the criterion reach statistical significance using the standard Type I error rate of .05. This technique may lead to liberal estimates of incremental predictive validity because some of the useful predictors from the other two domains may have been missed due to lack of power.

In this research, I chose a slightly (but not overly) conservative strategy for the inclusion of measures from the other two domains. I included measures from the other two domains if their bivariate correlations with the criterion had p values of .10 or less. The significance of the increase in R^2 when the other measures were added in was assessed using the traditional Type I error rate of .05.

The third analysis was based on the results of the second analysis. First, based on my previous results, I selected the best predictors from the three domains. Next, these predictors were compared to determine if EI predicts academic success as well as the other domains do. All variables were mean-deviated within gender before these analyses were conducted to prevent group differences from influencing the correlations (e.g., see Howell, 1987).

Results and Discussion

Examining Each Domain as a Whole

Each of the three domains was used to predict academic success by entering all of the available measures into a multiple regression equation (see

Table 4). The reader may be surprised to see that the EI domain had the largest R and R^2 values but that these values were not statistically significant, even though lower R and R^2 values for the cognitive and personality domains were significant. The R and R^2 values have been inflated for the EI domain because of the relatively small subject-to-variable ratio (150 to 31). In this situation, it is especially important to examine the adjusted R^2 values, which take into account the subject-to-variable ratio and provide a less biased estimate of the population R^2 value. Examining the adjusted R^2 values, it is clear that the cognitive and personality domains are able to predict academic achievement but that a collection of unselected EI measures is not. If EI measures predict academic success at all, only some EI measures do. More detailed analyses will be needed to determine if some specific EI measures predict academic success.

Multiple regressions were then conducted to determine if the addition of a domain increased the ability to predict academic success (see Table 5). The EI measures were not able to increase predictive validity when they were added to equations containing the cognitive or the personality variables. On the other hand, the cognitive and personality variables did increase predictive validity whenever they were added to the multiple regression equations. The reader might be somewhat confused by the fact that the large increases in R^2 that resulted when EI was added to the regression equations were not significant. If one examines the increase in the adjusted R^2 values, instead, it is clearer why these increases were not significant. From this analysis, it is clear that an arbitrary selection of EI measures should not be expected to improve our prediction of academic success. If some EI measures do improve our predictions in this area, we will need to locate these measures individually.

One other finding from these analyses is noteworthy. From Table 4, the reader will note that the adjusted R^2 values for the cognitive domain are slightly lower than the 20% figure quoted by Goleman (1995). There are many possible explanations for this. One possibility is restriction of range in either the predictors or criterion. Restriction of range in the predictors (cognitive abilities) is particularly likely, given that participants are all university students. These R^2 and adjusted R^2 values would likely be larger in a community sample or a sample of university applicants. Increases in the correlations for the personality and EI variables would also be possible if a more heterogeneous sample was used, but their increases would likely not be as large because these domains do not have a large influence on university admissions decisions. A second explanation for the low adjusted R^2 values for the cognitive abilities is the type of tests used. Only short group-administered paper-and-pencil tests were used to measure cognitive abilities. If longer tests or individually administered tests were used, larger values would likely result.

Table 4
Predictive Validities of the Three Domains

Domains Used as Predictors	Number of Predictors	Multiple R	Multiple R^2	Adjusted R^2
Cognitive	4	.437***	.191***	.168
Personality	5	.338***	.114***	.083
Emotional intelligence	31	.453	.206	–.005

Note. R^2 values are given to three decimal places to allow more accurate comparisons among the different multiple regressions. Significance tests were only done on R and R^2 values.
***$p < .01$.

Table 5
Incremental Predictive Validities of the Three Domains

Domain Included in First Multiple Regression	Domain Included in Second Multiple Regression	Increase in R^2	Increase in Adjusted R^2
Cognitive	Cognitive, *Personality*	.073**	.049
Cognitive	Cognitive, *EI*	.164	–.014
Personality	Personality, *Cognitive*	.150***	.134
Personality	Personality, *EI*	.216	.033
EI	EI, *Cognitive*	.150***	.159
EI	EI, *Personality*	.125***	.121
EI, Personality	*Cognitive*, Personality, EI	.104***	.106
EI, Cognitive	Cognitive, *Personality*, EI	.079**	.068
Cognitive, Personality	Cognitive, Personality, *EI*	.170	.005

Note. The domain being added is indicated in italics. Significance tests were only done on the increase in R^2.
**$p < .05$. ***$p < .01$.

Examining Specific Measures Within Each Domain

Within each domain, the predictive validity and the incremental predictive validity of each measure were assessed. Incremental predictive validity was calculated in two steps. First, academic success was predicted using just those variables from the other two domains that had significant ($p < .10$) correlations with academic success. Then, the variable in question was added, and the increase in R^2 was noted. The statistical significance of the increase was assessed using alpha = .05.

Cognitive Domain

Only one of the four measures had a significant correlation with academic success: verbal ability, $r = .43$, $p < .01$ (see Table 6). This variable was also

able to improve our prediction of academic success, when significant predictors from the personality and EI domains had already been taken into account. Verbal ability improved prediction by 9.2%, which is a very large increment.

Surprisingly, none of the other cognitive ability measures was significantly associated with academic success. If different cognitive abilities are associated with success in different courses, the lack of significant relations here might be explained by the fact that grades were obtained for students in different years and averaged over a variety of courses.

Personality Domain

Two of the five personality measures had statistically significant correlations with academic success. Conscientiousness had a significant correlation with academic success ($r = .33$, $p < .01$) and assisted in prediction when cognitive abilities and EI had already been taken into account, explaining 4.5% ($p < .01$) additional variance (see Table 6). Openness also had a significant correlation with academic success ($r = .17$, $p < .05$) but did not result in a significant improvement in the prediction of academic success.

Emotional Intelligence Domain

Six individual EI measures had significant correlations with academic success (see Table 7). These were three MSCEIT subtests designed to measure emotional understanding (C Blends, H Transitions, and L Analogies), the open-ended measure of emotional understanding (LEAS), a measure of social intelligence (social translations), and a self-report measure of the tendency to express positive emotions (positive expressivity). Total scores on the MSCEIT also had a statistically significant correlation with academic success. These seven measures explained an average of 3.5% of the variance in academic success.

When these six individual measures were entered into a single regression equation, they were able to predict approximately 8% of the variance in academic success (multiple $R^2 = .118$, adjusted $R^2 = .081$). Earlier we saw that cognitive abilities explained roughly 17% of the variance in academic success. Thus, the best EI predictors explained roughly half as much variance as an arbitrary selection of four cognitive abilities. This 8% figure should also be considered a liberal estimate of their efficacy because of their preselection based on significant bivariate correlations.

In addition, none of these seven EI measures was able to improve predictions of academic success when cognitive abilities and personality characteristics had already been taken into account. This could be explained if there

Table 6
Predictive Validities

Measure	Correlation	Increase in R^2
Cognitive measures		
Verbal ability	.425***	.092***
Verbal closure	.079	.007
Visualization	.061	.012
Inductive reasoning	.027	.022*
Personality measures		
Neuroticism	–.127	.000
Extraversion	.050	.015*
Openness	.171**	.000
Agreeableness	.142*	.011
Conscientiousness	.327***	.045***

Note. Increases in R^2 are given to three decimal places because these numbers are often quite small.
*$p < .10$. **$p < .05$. ***$p < .01$.

was a lot of overlap between these measures and verbal ability, conscientiousness, and/or openness, each of which was related to academic success. In fact, six of these seven measures had significant correlations with verbal ability, and the remaining measure—positive expressivity—had a significant correlation with openness (see Table 8).

Two EI measures were able to improve prediction of academic success when cognitive abilities and personality dimensions had already been taken into account. These were the self-report measures of the tendency to pay attention to one's emotions (attention) and the tendency to base decisions on emotions rather than logic (flexible planning). These measures improved prediction by 2.9% and 2.0%, respectively. Both of these measures had negative (but nonsignificant) correlations with academic success. In the multiple regression equations used to assess incremental predictive validity, the beta-weights for these two measures were negative and statistically significant. From these results, it appears that higher levels of attention and flexible planning are associated with lower levels of academic success among people with equal levels of verbal ability, conscientiousness, and openness. In some circumstances, then, higher levels of EI appear to be associated with lower academic success. These results should be treated cautiously, however, because these two statistically significant results could be Type I errors: In a set of 32 significance tests, each using $\alpha = .05$, the probability that 2 of them will be statistically significant is approximately .27. The negative relations of attention and flexible planning with academic success should therefore be considered a hypothesis that emerges from this study, not a conclusion. Replication of this result is needed.

Table 7
Predictive Validities of the Emotional Intelligence Measures

Measure	Correlation	Increase in R^2
MSCEIT A faces	.112	.000
MSCEIT B synesthesia	.106	.000
MSCEIT C blends	.210***	.000
MSCEIT D progressions	.119	.000
MSCEIT E emotions in relationships	.059	.007
MSCEIT F landscapes	–.020	.002
MSCEIT G facilitation	–.023	.019*
MSCEIT H transitions	.204**	.003
MSCEIT I emotion management	.066	.002
MSCEIT J designs	–.029	.004
MSCEIT K sensation translation	–.027	.012
MSCEIT L analogies	.172**	.003
Expression grouping	.068	.000
Cartoon predictions	.073	.003
Missing cartoons	.150*	.000
Social translations	.172**	.001
Levels of Emotional Awareness scale	.160**	.005
Difficulty identifying feelings	–.055	.014*
Difficulty describing feelings	–.095	.000
Emotional appropriateness	.128	.004
Recognition of emotion in others	.074	.005
Repair	–.010	.005
Regulation of emotions in the self	–.018	.010
Regulation of emotion in others	.079	.000
Attention	–.054	.029**
Positive expressivity	.184**	.019*
Negative expressivity	–.017	.001
Flexible planning	–.087	.020**
Empathy	.045	.001
Positive sharing	.039	.000
Empathic concern	.036	.000
MSCEIT total scores	.205**	.000

Note. MSCEIT = Mayer-Salovey-Caruso Emotional Intelligence Test.
*$p < .10$. **$p < .05$. ***$p < .01$.

Comparing the Best Individual Predictors From the Three Domains

The best individual predictors from each of the three domains were selected and their correlations with academic success were compared to determine if EI could predict academic success as well as the other two domains can. The best predictors from the three domains were verbal ability ($r = .43$), conscientiousness ($r = .33$), and MSCEIT C Blends ($r = .21$). These correlations were compared using Williams's (1959) T2 statistic. Only the difference between the validities for verbal ability and MSCEIT C was statis-

Table 8
Correlations Between the Emotional Intelligence Measures and the Significant Predictors of Academic Success From the Cognitive and Personality Domains

	Verbal Ability	Conscientiousness	Openness
MSCEIT A faces	.251***	.049	.082
MSCEIT B synesthesia	.249***	.077	.044
MSCEIT C blends	.526***	.105	.214***
MSCEIT D progressions	.199**	.118	.046
MSCEIT E emotions in relationships	.189**	.235***	.136*
MSCEIT F landscapes	.076	–.058	–.153*
MSCEIT G facilitation	.085	.181**	.158*
MSCEIT H transitions	.215***	.233***	.208**
MSCEIT I emotion management	.118	.206**	.112
MSCEIT J designs	.070	–.007	–.047
MSCEIT K sensation translation	.140*	.041	.101
MSCEIT L analogies	.311***	.020	–.043
Expression grouping	.245***	–.060	.110
Cartoon predictions	.091	–.124	.086
Missing cartoons	.336***	–.035	.236***
Social translations	.234***	.144*	.156*
Levels of Emotional Awareness scale	.237***	.038	.136*
Difficulty identifying feelings	–.189**	–.343***	–.148*
Difficulty describing feelings	–.111	–.205**	–.137*
Emotional appropriateness	.174**	–.002	–.081
Recognition of emotion in others	.188**	.244***	.369***
Repair	.019	.202**	.226***
Regulation of emotions in the self	.118	.171**	.039
Regulation of emotion in others	.071	.197**	.296***
Attention	.075	.250***	.448***
Positive expressivity	.060	.156*	.335***
Negative expressivity	–.067	–.116	.037
Flexible planning	.103	.032	.335***
Empathy	–.101	.144*	.303***
Positive sharing	–.051	.122	.160*
Empathic concern	–.063	.145*	.236***
MSCEIT total scores	.444***	.172**	.124

Note. MSCEIT = Mayer-Salovey-Caruso Emotional Intelligence Test.
*$p < .10$. **$p < .05$. ***$p < .01$.

tically significant, $T2(147) = 2.92$, $p < .001$. It therefore appears that EI measures are not as good at predicting academic success as are measures of cognitive abilities, although they might be as good as measures of personality.

Conclusions

The popular media has sometimes claimed that EI is more important than IQ in terms of success in a variety of areas (Goleman, 1995; *TIME*, 1995). This study has shown that this is not the case in the area of academic success.

If a large number of EI measures are used without preselection, these measures cannot predict academic success. The cognitive ability domain and the personality domain do a far better job at predicting academic success. When considering just one measure at a time, some measures of EI (particularly measures of emotional understanding) can be used to predict academic success. However, these measures do not improve our prediction of academic success if relevant cognitive abilities and personality characteristics have already been taken into account. It therefore appears that EI is not the panacea that some writers claim. EI is associated with academic success but not to the same extent as—and certainly not to a greater extent than—verbal ability.

There may be specific academic areas—such as graduate education for counselors—where EI is extremely important, and future research should try to identify those areas. This study did not distinguish between different years or areas of study, and may therefore have overlooked academic areas where EI is important. There also may be many criteria of life success—such as interpersonal success or success in people-oriented jobs such as management or sales—that EI can predict and can predict well. Additional research is needed to identify those areas.

Future research should consider predictive validity and incremental predictive validity: It is not enough to know that EI predicts success; we also need to know if it improves our predictions so that it is worthwhile to add EI measures to existing test batteries. Previous research on EI (and related constructs such as social intelligence, empathy, and alexithymia) has often overlooked the question of incremental predictive validity. For employers, institutions, or clinicians who are thinking of adding EI measures to existing test batteries, incremental predictive validity is the most important question of all.

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