

Examination of the Discriminant, Convergent, and Criterion-Related Validity of Self-Ratings on the Emotional Competence Inventory

John C. Byrne*, Peter G. Dominick**,
James W. Smither*** and Richard R. Reilly**

*Lubin School of Business, Pace University, New York, NY 10038, USA. jbyrne@pace.edu

**Stevens Institute of Technology, Hoboken, NJ 07030-5991, USA

***School of Business Administration, La Salle University, Philadelphia, PA 19141, USA

We found that self-ratings on the Emotional Competence Inventory (ECI) had small relationships with, but a distinct factor structure from, the Big-Five personality dimensions. ECI self-ratings were unrelated to academic performance and general mental ability. ECI self-ratings had significant, albeit small, correlations with EC-related behaviors and peer nominations of influence during a leaderless group discussion, coworkers' ratings of managerial skills, and number of promotions received. However, with one exception, these significant relationships disappeared after controlling for personality and age.

1. Introduction

Popular and academic interest in emotional intelligence (EI) has soared in recent years. Popular interest has been fueled largely by Daniel Goleman's *Emotional Intelligence* (1995) as well as a growing number of books and articles that describe the purported importance of EI for work and leadership (Caruso & Salovey, 2004; Cherniss & Goleman, 2001; Emmerling & Cherniss, 2003; George, 2000; Goleman, 1998a; Goleman, 1998b; Goleman, 2000; Goleman, Boyatzis, & McKee, 2002). At the same time, academic interest has grown at an exponential rate. A search of PsycINFO for the term 'emotional intelligence' from 1980 to 1989 yielded four citations, from 1990 to 1999 yielded 70 citations, and from 2000 through August 2006 yielded 937 citations. When the *Harvard Business Review* published Goleman's 1998 article on EI, it attracted a higher percentage of readers than any other article

published in that periodical for the previous 40 years (Cherniss, 2000).

The interest in EI is likely related to the claims of some of its proponents. For example, Goleman (1995, p. 36) stated that EI provides one with 'an advantage in any domain in life, whether in romance and intimate relationships or picking up the unspoken rules that govern success in organizational politics.' Unfortunately, the explosion of interest in EI was not accompanied by any consensus about how it should be defined or measured, or even whether the concept meets scientific criteria for a meaningful psychological construct (Matthews, Zeidner, & Roberts, 2003; Conte, 2005; Landy, 2005; Locke, 2005).

In this paper, we note the need for empirical research concerning the Emotional Competence Inventory (ECI), especially because this measurement tool was created primarily to reflect Goleman's EI model. Although his model has had an enormous impact on

popular conceptions of EI, the ways in which it contributes to a better understanding of EI as a construct have yet to be fully explored. For instance, as Conte (2005) noted, 'few independent, peer-reviewed assessments of the reliability and validity of the ECI have been undertaken and published.' To this end, this paper furthers existing research by presenting the results of an empirical study that examines the extent of overlap between self-ratings on the ECI and self-ratings of personality as well as the convergent and criterion-related validity of the ECI.

1.1. ECI based upon a mixed model

Proponents of mixed models of EI (e.g., Bar-On, 1997; Cooper, 1997; Cooper & Sawaf, 1998; Goleman, 1995, 1998a; Petrides, Pérez, & Furnham, 2003; Pérez, Petrides, & Furnham, 2005) view EI as a combination of abilities, personality-like traits, motivation, and skills. For example, Goleman (1998a) states that EI 'refers to the capacity for recognizing our own feelings and those of others, for motivating ourselves, and for managing emotions well in ourselves and our relationships . . . abilities distinct from, but complementary to academic intelligence.'

Mixed-model proponents argue that EI is distinct from personality and general cognitive ability. But critics argue that the scales used to measure mixed models of EI yield merely self-(or others') perceptions rather than an estimate of a person's actual emotional ability (Daus & Ashkanasy, 2003). They also point to evidence that self-report scales (such as ECI) overlap with personality measures (e.g., Brackett & Mayer, 2003; Ciarrochi, Chan, Caputi, & Roberts, 2001; Davies, Stankov, & Roberts, 1998; Dawda & Hart, 2000; MacCann, Matthews, Zeidner, & Roberts, 2003; Saklofske, Austin, & Minski, 2003; van der Zee, Thijs, & Schakel, 2002) and argue that this overlap with personality means that these EI measures lack discriminant validity. In addition, self- and other ratings of EI tend to have very little relationship with traditional measures of intelligence or general mental ability (GMA) (e.g., Derksen, Kramer, & Katzko, 2002; MacCann, Matthews, Zeidner, & Roberts, 2003; Saklofske, Austin, & Minski, 2003). Finally, critics argue that proponents of mixed models have made unsupported and sweeping claims (Matthews, Zeidner, & Roberts, 2003; Thingujam, 2002) and that these mixed models should not be called EI (Caruso, 2003; Ashkanasy & Daus, 2005).

In contrast, there are also EI ability models, and proponents of such models (e.g., Mayer, Salovey, & Caruso, 2000; Law, Wong, & Song, 2004) define EI as 'a type of social intelligence that involves the ability to monitor one's own and others' emotions, to discriminate among them, and to use the information to guide one's thinking and actions' (Mayer & Salovey, 1993, p. 433).

1.2. The ECI

The ECI is a self-report and other-report EI measure designed to assess the emotional competencies identified by Goleman (1998a). He defines emotional competence as 'an ability to recognize, understand and use emotional information about oneself or others that leads to or causes effective or superior performance' (Goleman, 1998a, p. 5). Its development was also influenced by Hay/McBer's *Generic Competency Dictionary* and an earlier questionnaire developed by Boyatzis (e.g., Boyatzis, 1994; Boyatzis, Baker, Leonard, Rhee, & Thompson, 1995; Boyatzis, Leonard, Rhee, & Wheeler, 1996). The ECI purports to assess 18 emotional competencies organized into four clusters: self-awareness, self-management, social awareness, and social skills. Self-awareness refers to knowing one's internal states, preferences, resources, and intuitions. Self-management refers to managing one's internal states, impulses, and resources. Social awareness refers to how people handle relationships and one's awareness of others' feelings, needs, and concerns. Social skills refer to adeptness at inducing desirable responses in others. Boyatzis, Goleman, and Rhee (2000) outlined the rationale for the clustering and organization of EI competencies.

A study by Murensky (2000) examined the correlation between ECI self-ratings and the five-factor model of personality. ECI self-ratings were significantly correlated with extraversion (r ranged from .24 to .49), agreeableness (r ranged from .20 to .28), and conscientiousness (.21–.39) but were unrelated to neuroticism and agreeableness. Also, only three of the ECI clusters were significantly related to scores on the Watson–Glaser Critical Thinking Appraisal, a measure of cognitive ability. The three significant correlations pointed to small, negative relationships between ECI and critical thinking. Proponents of ECI argue that this latter finding provides evidence for the discriminant validity of ECI.

1.3. Meta-analysis of EI measures

Van Rooy and Viswesvaran (2004) state that ' . . . there is a serious lack of research examining the predictive validity of existing measures of EI; even less is known about its predictive validity in work situations' (p. 75). Van Rooy and Viswesvaran's (2004) meta-analysis found that the mean correlation between EI measures (of all types) and work-related outcomes was .24. However, this effect size is difficult to interpret because it is based on different measures of EI (including measures based on both the ability and mixed models). Moreover, only 27% of the variance in observed correlations was due to sampling error, thereby suggesting that validity is

likely moderated by the type of EI measure or other factors (e.g., type of criterion, job, and work setting).

At the same time, however, a .24 correlation is within the bounds of what has been reported for other predictors of work-related outcomes. It is higher than the meta-analytic validities reported by Barrick and Mount (1991) in their investigation of the Big-Five personality factors as predictors of work outcomes. They reported that conscientiousness, the strongest overall predictor, only had a correlation of .22. On the other hand, the .24 correlation reported by Van Rooy and Viswesvaran is considerably less than what is typically reported for GMA. Schmidt and Hunter (2004) reported that the correlation between GMA and job performance was about .55 based on an average of the results from 12 separate meta-analytic studies.

Van Rooy and Viswesvaran (2004) also reported a mean predictive validity of .20 for six studies that used the ECI but this effect size is also difficult to interpret because it was apparently based on a mix of outcome measures (including academic, work-related, and other variables). Also, this meta-analysis did not describe the incremental validity of ECI above and beyond personality. Moreover, only 20% of the variance in observed ECI correlations was due to sampling error, thereby suggesting that the validity of ECI is likely moderated by other factors (e.g., type of criterion).

Finally, Van Rooy and Viswesvaran (2004) found that mixed-model EI measures (such as ECI) were generally unrelated to cognitive ability (mean correlation = .09). The mean correlation between EI measures (of all types) and personality ranged from .23 (with agreeableness and openness to experience) to .34 (with extraversion).

In a subsequent meta-analysis, Van Rooy, Viswesvaran, and Pluta (2005) expanded upon the 2004 meta-analytic findings. In this instance, they reported that mixed-model EI measures highly correlate among themselves (.71) and the ability EI measures were found to be relatively distinct (.14). Mixed-model measures also demonstrated more overlap with personality when compared with ability EI measures. Further, ability-based EI measures had a higher correlation with cognitive ability than mixed measures (.34 vs .13).

1.4. The current study

This study extends the emerging literature on EI by examining the extent of overlap between ECI self-ratings and a well-established measure of the Big-Five personality dimensions and by determining whether self-ratings of EC and personality have distinct factor structures. We also present evidence concerning the convergent validity of ECI self-ratings by examining whether such ratings are related to the extent to which participants demonstrate EC-related behaviors during a leaderless group discussion (LGD). Finally, we go beyond

previous research by examining the criterion-related validity of ECI self-ratings for predicting work-related outcomes after controlling for personality.

Despite the widespread popularity of Goleman's writings and the growing attention to the ECI (an August 2006 search on Google of the term 'Emotional Competence Inventory' yielded 995 sites), there is a dearth of research on its criterion-related validity. In its discussion of criterion-related validity, the ECI technical manual (Sala, 2002) describes only eight studies; none of these were published in peer-reviewed journals or presented at peer-reviewed conferences. (Four of these studies were included in the Van Rooy and Viswesvaran meta-analysis described above.) A search of the PsycINFO database (August 20, 2004) for the term 'Emotional Competence Inventory' also yielded no peer-reviewed empirical studies concerning the ECI's criterion-related validity. In writing about his EI model, Goleman often refers to studies showing the relationship between EI-related dispositions and competencies (e.g., self-confidence, empathy, achievement orientation, conscientiousness) and work performance, without presenting evidence concerning the criterion-related validity of the ECI itself (Goleman, 2001). Mayer (1999) argues that this amounts to '... using a catchy new name to sell worthy, old-fashioned personality research and prediction.'

As noted above, a study by Murensky (2000) found small correlations between the ECI measures and several personality dimensions. Many studies have shown that there is a consistent, albeit small, relationship between personality and job performance (Barrick & Mount, 1991; Mount, Barrick, & Stewart, 1998), leadership (Judge, Bono, Ilies, & Gerhardt, 2002; Lord, De Vader, & Alliger, 1986), and team effectiveness (Barrick, Stewart, Neubert, & Mount, 1998). Taken together, these findings point to the need to examine whether the ECI can predict work-related outcomes beyond what could be predicted by personality.

Based on the literature reviewed above, we examined five research questions.

1. What is the extent of overlap between ECI self-ratings and the Big-Five personality dimensions (neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness)?
2. Do ECI self-ratings and the Big-Five personality dimensions have distinct factor structures (i.e., discriminant validity)?
3. Are ECI self-ratings related to EC behaviors exhibited during an LGD (i.e., convergent validity)?
4. Are ECI self-ratings related to measures of work-related outcomes (peer nominations of influence in an LGD, number of promotions received, and coworker feedback concerning managerial skills)?

5. Are ECI self-ratings significantly related to work-related outcomes *after* controlling for the Big-Five personality dimensions?

2. Method

2.1. Overview

As part of their participation in a graduate course, students from three universities completed self-ratings on the ECI and the NEO Five-Factor Inventory. They also received multi-rater feedback from coworkers about their managerial skills and provided information concerning their years of work experience, the number of promotions they had received since completing their undergraduate degree, their academic performance (undergraduate grade point average), and their scores on the Graduate Management Admission Test (GMAT – a surrogate measure of GMA; see Frey & Detterman, 2004). They also participated in an LGD with six to 10 participants in each group. At the end of the LGD, participants nominated the three peers who most contributed to the group's decision. The LGD sessions were also videotaped and participants' behaviors related to emotional competence were rated by two trained assessors using a codebook adapted from Boyatzis (2002). We then examined the relationships between three predictors (personality, academic performance, and self-ratings of emotional competence) with four criteria (emotional competence behaviors displayed during the LGD, LGD peer nominations, promotions, and coworkers' ratings of managerial skills).

2.2. Participants

The age of participants ranged from 20 to 63 ($M = 31.23$, $SD = 8.16$, $n = 324$). Forty percent were female and 39.4% identified themselves as minority, with 4.9% choosing not to identify their status. The largest minority group (16.9%) consisted of non-American Asians (including the Indian subcontinent), and African Americans comprised 6.8% of the participants.

On average, participants had 8.46 years of work experience ($SD = 8.30$) since completing their undergraduate degree. The mean undergraduate grade point average (GPA) was 3.23 ($SD = .41$, $n = 297$). The mean GMAT score was 540.23 ($SD = 60.02$, $n = 149$). For comparison purposes, the mean GMAT score from six other peer schools was 565 ($n = 1106$) based upon data obtained from AACSB for the years 2004–2005.

The participants were all enrolled in part-time graduate management programs at one of three northeastern private institutions. All were working professionals. They were asked to volunteer while they completed leadership development courses offered at

each of the three institutions. They did not receive any extra credit or compensation for their participation in this study.

2.3. Measures

2.1.1. Personality

Participants ($n = 321$) completed the NEO Five-Factor Inventory (NEO-FFI) Form S, which consists of 60 items and yields scores for five personality factors: neuroticism (N), extraversion (E), openness to experience (O), agreeableness (A), and conscientiousness (C). Respondents use a five-point scale (strongly disagree to strongly agree) to indicate the extent to which each statement accurately describes them. Published internal consistency coefficients for the NEO-FFI scales are .86, .77, .73, .68, and .81 for N, E, O, A, and C, respectively (Costa & McCrae, 1992). The corresponding internal consistency coefficients for our sample were .84, .76, .68, .71, and .81. Consistent with previous research (e.g., Ackerman, Kanfer & Goff, 1995), correlations among the five-factors in our sample were low to moderate (see Table 2).

2.1.2. Emotional competence

Participants ($n = 298$) completed self-ratings on the ECI – Version 2. The ECI is a 73-item inventory where respondents indicate the degree to which each statement accurately describes them on a 5-point scale (1 = never; 2 = rarely; 3 = sometimes; 4 = often; 5 = consistently). The ECI purports to assess 18 competencies organized into four clusters (number of items are in parentheses): *self-awareness* (SA) – emotional self-awareness (3), accurate self-assessment (4), and self-confidence (4); *self-management* (SM) – emotional self-control (4), trustworthiness (4), adaptability (5), achievement orientation (4), initiative (4), optimism (4); *social awareness* (SocA) – organizational awareness (4), service orientation (4), empathy (4); and *social skills* (SS) – developing others (4), inspirational leadership (4), influence (4), change catalyst (5), conflict management (4), teamwork, and collaboration (4). Internal consistency coefficients for self-ratings reported in the ECI Technical Manual for self-awareness, self-management, social awareness, and social skills were .61, .79, .71, and .92, respectively. In the present study, the corresponding values were .52, .83, .70, and .87.

2.1.3. Coworker ratings of managerial skills (CRMS)

Participants were asked to select three to 10 coworkers (e.g., peers, supervisors, subordinates) to provide ratings of their managerial skills. Coworkers' ratings were anonymous and the data-collection process did not allow us to separate raters into categories (i.e., peers, subordinates, or supervisors). The ratings

were returned to the researchers and participants who were rated by three or more coworkers received a feedback report that contained the average and standard deviation of the ratings they received on each item. The feedback report was provided only to the participant and the ratings did not affect course grades in any way. Participants received their feedback after completing the other measures (e.g., NEO, ECI) and after participating in the LGD. The coworker feedback instrument was initially developed to support management skills development courses being taught at the three universities that provided participants for this study. These items were developed based on Whetten and Cameron's (2005) list of the most frequently cited skills of effective managers and hence assessed a broad range of skills including time management, seeking feedback from others, problem solving, communication, influence, motivating others, conducting meetings, making presentations, empowering others, resolving conflicts, and teamwork. Ratings were provided on 40 items using a 1 (not at all) to 5 (to a very great extent) scale. Correlations among the 40 items were very high (internal consistency = .89). Consistent with previous research on multi-rater feedback (e.g., Walker & Smith, 1999), we calculated r_{wg} , a measure of interrater agreement (James, Demaree, & Wolf, 1993; James, Demaree, & Wolf, 1984; Kozlowski & Hatrup, 1992), for each participant. Using the formula for estimating σ_E^2 for five-point scales for samples with a slight negative skew, the average r_{wg} was found to be .89. Because of the high level of coworker agreement, we calculated each participant's average rating across raters and items. Hereafter, we refer to this score as CRMS.

Only participants who received feedback from three or more coworkers were included in the analyses. CRMS were available for 161 participants. Participants did not seek coworker feedback if they had been working at an employer for a short time, were self-employed, or between jobs. We also tested for differences between participants who did and did not receive coworker ratings. Independent group *t*-tests revealed that the two groups differed ($p < .05$) on several variables. Relative to participants who were not rated by coworkers, those who received coworker ratings were older (28.27 vs 34.29, Cohen's $d = .80$), had more work experience (5.35 vs 11.72, $d = .84$), had higher self-reported social awareness (3.97 vs 4.07, $d = .27$) and social skills (3.64 vs 3.75, $d = .26$) on the ECI, had received more promotions given their age ($-.12$ vs $.15$, $d = .29$), and demonstrated more EC behaviors during the LGD (3.42 vs 4.06, $d = .83$). There were no significant differences between the two groups on the other ECI or criterion measures. In sum, there were large differences between the two groups with respect to age and work experience, whereas differences in the other variables were generally small. According to

Cohen (1988), small, medium, and large values of d are about .20, .50, and .80, respectively. It is noteworthy that the differences between the two groups with respect to ECI social awareness, ECI social skills, and promotions were no longer significant (all $p > .15$) after controlling for age. Therefore, in a subsequent analysis, we examine the relationship between ECI and CRMS after controlling for age.

2.1.4. LGD peer nominations

Six to 10 participants were assigned to each group. Each group was told they were the Board of Directors for an aerospace company and their task was to select a new CEO (because the current CEO would be retiring in 90 days) as well as a 'second-in-command' in case the selected CEO was not able to fulfill the obligations of the position. Each participant read a one-page overview of the company's business and a brief description of seven candidates. Each group was asked to come to a consensus decision. On average, groups completed the task in 40–50 min. These group discussions were videotaped.

At the end of each group discussion, each member voted anonymously for the three peers who most contributed to the group's decision (self-nominations were permitted). These peer nominations were anonymous and collected in writing. To adjust for group size, the number of nominations each participant received was divided by 'LGD group size - 1.' To correct for skewness, the resulting distributions were then normalized. In total, LGD peer nominations were available for 269 participants. Peer nominations have been shown to be reliable and valid measures of job performance and potential (Kane & Lawler, 1978).

2.1.5. LGD behaviors

Two expert judges, each with greater than 20 years of assessment experience, evaluated the videotapes of LGD sessions using a codebook developed by Boyatzis for analyzing behavior related to EI (Boyatzis, 2002; see also Boyatzis, 1998). The codebook presented examples of EC behaviors to guide the ratings of each participant on each emotional competency. For example, communication is operationalized as listening openly and sending convincing messages. Conflict management includes negotiating and resolving disagreements. Teamwork and collaboration implies working with others and creating group cooperation toward shared goals.

Sample tapes were reviewed and the codebook was amended by a team of three doctoral-level industrial and organizational psychologists. The amendments involved eliminating behaviors that were not likely to be observed in the videotapes. After reviewing the codebook and rating forms, the judges observed five videotapes (to become familiar with target behaviors and the

rating process). To determine the level of inter-rater reliability, both judges evaluated 104 participants, with each judge rating each participant on each of 14 competencies. Each of the two judges then independently evaluated half of the remaining participants. In total, LGD behavior ratings were available for 276 participants.

A principal components analysis of the judges' ratings yielded one large factor with an eigenvalue of 11.14 that accounted for 80% of the variance. All other eigenvalues were $<.61$. We therefore created an overall EC behavior score for each participant (the participant's average rating across the 14 competencies). As noted above, there were ratings from two judges for 104 participants; the reliability (intraclass coefficient) for two raters was $.77$. As there was only one rating for many of the participants, we used the Spearman–Brown formula to calculate the reliability for one rater ($.62$).

Because the content of these ratings (emotional competencies) closely parallels the content of the ECI, we considered the correlation between ECI self-ratings and judges' ratings of EC behaviors as a measure of the convergent validity of the ECI.

2.1.6. Number of promotions

Because the number of promotions was positively correlated with age ($r = .21$, $p < .01$), we adjusted the number of promotions to account for age using the formula $(10 \times \text{'number of promotions'})/\text{age}$, which was then normalized. We hereafter refer to this variable as age-adjusted number of promotions (AA promotions). This variable was available for all participants.

3. Results

3.1. ECI confirmatory factor analysis

We first conducted a confirmatory factor analysis using LISREL 8.54 to evaluate whether the 18 competencies

loaded on the four ECI clusters as hypothesized. Bentler (1990) recommended that the comparative fit index (CFI) should exceed $.90$ to be considered a good fit. Byrne (1998) and Steiger (1990) recommended that the root mean square error of approximation (RMSEA) should be $<.08$ or $.10$, respectively. The results showed a good fit to the hypothesized loadings (RMSEA = $.07$, CFI = $.96$). Correlations among the four ECI clusters are presented in Table 2.

We also wanted to test whether an alternative model offered a better fit. For this purpose, we ran a one-factor model. For the one-factor model, the χ^2 value was 352.96, ($df = 135$). For the four-factor model, the χ^2 value was 343.79, ($df = 129$). As the ECI is conceptualized as a four-factor model, we felt that it was necessary to look at the validity of each of the four ECI clusters. However, the difference between the one-factor and the four-factor model was not significant. Therefore, we also examined the validity of an overall, composite ECI score (i.e., the average rating across all ECI items).

3.2. Gender differences

Tables 1a–1e summarize the separate results obtained for males and females. Earlier, Ciarrochi, Chan, and Caputi (2000, pp. 542–543) suggested that women ought to score higher on EI than men. As a result, we ran independent sample *t*-tests comparing the differences between men and women on the ECI. The results of this analysis indicate that women did not score higher than men. The composite ECI score for men was 3.83 and 3.77 for women. For two of the ECI clusters, the differences between men and women were significant. The self-management mean score for men was 3.71 and 3.62 for women ($t = 2.2$, $p = .028$, $df = 296$). For social skills, the mean for men was 3.74 and 3.61 for women ($t = 2.5$, $p = .012$, $df = 296$).

Table 1a. Descriptive statistics and correlations for white/Caucasian participants

	Mean	SD	<i>n</i>	SA	SM	SocA	SS	ECI composite	AA promotions	LGD nominations	LGD behaviors	CRMS
SA	3.85	.31	167		.46**	.42**	.49**	.69**	.08	.12	.17**	.12
SM	3.70	.35	167			.66**	.76**	.88**	.21**	.03	.15	.09
SocA	4.03	.36	167				.66**	.84**	.15	.02	.23**	.24*
SS	3.71	.40	167					.90**	.21**	.05	.20*	.15
ECI composite	3.82	.30	167						.20*	.06	.23**	.18
AA promotions	.06	1.01	179							.23**	.13	-.03
LGD nominations	.06	.92	143								.08	.05
LGD behaviors	3.88	.85	148									-.03
CRMS	3.77	.39	103									

Notes: **Correlation is significant at the $.01$ level (two-tailed). *Correlation is significant at the $.05$ level (two-tailed). SA, Emotional Competence Inventory (ECI) self-awareness; SM, ECI self-management; SocA, ECI social awareness; SS, ECI social skills; AA promotions, age-adjusted promotions; LGD nominations, leaderless group discussion (LGD) peer nominations; LGD behaviors, EC behaviors demonstrated during LGD; CRMS, coworker ratings of managerial skills.

Table 1b. Descriptive statistics and correlations for Asian participants

	Mean	SD	n	SA	SM	SocA	SS	ECI composite	AA promotions	LGD nominations	LGD behaviors	CRMS
SA	3.71	.40	68		.52**	.58**	.63**	.78**	.12	.35**	.24	.07
SM	3.65	.36	68			.72**	.85**	.88**	.20	.38**	.21	.46*
SocA	3.97	.41	68				.82*	.89*	.28*	.48**	.26*	.54*
SS	3.63	.48	68					.95**	.23	.47**	.29*	.56*
ECI composite	3.74	.36	68						.24	.48**	.29*	.56*
AA promotions	-.18	.94	72							.01	.04	.11
LGD nominations	-.06	.88	68								.58**	.42
LGD behaviors	3.48	.87	69									.43
CRMS	3.86	.42	22									

Notes: **Correlation is significant at the .01 level (two-tailed). *Correlation is significant at the .05 level (two-tailed). SA, Emotional Competence Inventory (ECI) self-awareness; SM, ECI self-management; SocA, ECI social awareness; SS, ECI social skills; AA promotions, age-adjusted promotions; LGD nominations, leaderless group discussion (LGD) peer nominations; LGD behaviors, EC behaviors demonstrated during LGD; CRMS, coworker ratings of managerial skills.

Table 1c. Descriptive statistics and correlations for African-American participants

	Mean	SD	n	SA	SM	SocA	SS	ECI composite	AA promotions	LGD nominations	LGD behaviors	CRMS
SA	3.92	.415	21		.56**	.54*	.17	.75**	.13	-.17	-.34	-.46
SM	3.56	.30	21			.59**	.58**	.85**	.03	.02	-.02	-.40
SocA	4.02	.38	21				.50*	.85**	.25	-.03	.02	-.36
SS	3.65	.33	21					.69**	.16	.29	.17	.33
ECI composite	3.79	.28	21						.19	.02	-.07	-.25
AA promotions	.28	.74	21							-.24	-.25	.25
LGD nominations	.20	.68	21								.19	.56
LGD behaviors	3.56	.83	21									.37
CRMS	3.54	.45	10									

Notes: **Correlation is significant at the .01 level (two-tailed). *Correlation is significant at the .05 level (two-tailed). SA, Emotional Competence Inventory (ECI) self-awareness; SM, ECI self-management; SocA, ECI social awareness; SS, ECI social skills; AA promotions, age-adjusted promotions; LGD nominations, leaderless group discussion (LGD) peer nominations; LGD behaviors, EC behaviors demonstrated during LGD; CRMS, coworker ratings of managerial skills.

Table 1d. Descriptive statistics and correlations for female participants

	Mean	SD	n	SA	SM	SocA	SS	ECI composite	AA promotions	LGD nominations	LGD behaviors	CRMS
SA	3.85	.36	119		.53**	.49**	.57**	.75**	.11	.12	.00	-.02
SM	3.62	.37	119			.64**	.82**	.89**	.25**	.05	.20*	.01
SocA	3.97	.39	119				.67**	.83**	.27**	.13	.27**	.12
SS	3.62	.46	119					.92**	.22*	.16	.21*	.26
ECI composite	3.77	.33	119						.25**	.14	.20*	.13
AA promotions	-.09	.94	127							.26**	.01	.16
LGD nominations	-.02	.85	112								.18	.34*
LGD behaviors	3.70	.86	113									.22
CRMS	3.76	.37	58									

Notes: **Correlation is significant at the .01 level (two-tailed). *Correlation is significant at the .05 level (two-tailed). SA, Emotional Competence Inventory (ECI) self-awareness; SM, ECI self-management; SocA, ECI social awareness; SS, ECI social skills; AA promotions, age-adjusted promotions; LGD nominations, leaderless group discussion (LGD) peer nominations; LGD behaviors, EC behaviors demonstrated during LGD; CRMS, coworker ratings of managerial skills.

3.3. Discriminant validity

We next sought to examine whether the NEO and ECI measure distinct constructs. Correlations between the NEO five factors and the four ECI clusters (as well as the ECI composite) are presented in Table 2. ECI self-

ratings for all four clusters were negatively related to neuroticism. ECI self-ratings were positively correlated with the other four NEO factors. The strongest correlation was between extraversion and ECI social skills ($r = .57$), with most of the remaining correlations ranging between .20 and .40. Note that these correla-

Table 1e. Descriptive statistics and correlations for male participants

	Mean	SD	n	SA	SM	SocA	SS	ECI composite	AA promotions	LGD nominations	LGD behaviors	CRMS
SA	3.82	.35	179		.51**	.52**	.54**	.75**	.18**	.23**	.28**	.17
SM	3.71	.35	179			.67**	.76**	.87**	.17*	.15	.18*	.27**
SocA	4.05	.37	179				.72**	.86**	.14	.16*	.23**	.37**
SS	3.74	.40	179					.90**	.23**	.23**	.28**	.29**
ECI composite	3.83	.31	179						.22**	.23**	.29**	.33**
AA promotions	.09	.95	190							.03	.12	-.05
LGD nominations	.09	.92	157								.30**	.05
LGD behaviors	3.72	.87	162									.01
CRMS	3.79	.43	103									

Notes: **Correlation is significant at the .01 level (two-tailed). *Correlation is significant at the .05 level (two-tailed). SA, Emotional Competence Inventory (ECI) self-awareness; SM, ECI self-management; SocA, ECI social awareness; SS, ECI social skills; AA promotions, age-adjusted promotions; LGD nominations, leaderless group discussion (LGD) peer nominations; LGD behaviors, EC behaviors demonstrated during LGD; CRMS, coworker ratings of managerial skills.

tions are similar in magnitude to the meta-analytic correlations between EI and personality reported by Van Rooy and Viswesvaran (2004).

One method of assessing the discriminant validity of a measure is to show that the measure has a latent structure that is distinct from the latent structure of relevant but conceptually distinct variables. We therefore used LISREL 8.54 to conduct a confirmatory factor analysis of the NEO and ECI. To do so, we first randomly grouped NEO items to form three indicators (each consisting of 4 items) for each NEO factor and used these indicators as an input to the confirmatory factor analyses. This practice is quite common in the literature (e.g., Drasgow & Kanfer, 1985; Law, Wong, & Song, 2004; Lynn, Reilly, & Akgün, 2000; Mathieu & Farr, 1991; Mathieu, Hofmann, & Farr, 1993). We also included the 18 ECI competency scores. Our CFA tested whether these 33 variables fit the hypothesized latent structure of five NEO factors and four ECI clusters. The results indicated a good fit (CFI = .94, RMSEA = .07). These results indicate that NEO and ECI, while moderately correlated, appear to measure distinct constructs.

We also examined the correlation of the four ECI clusters with undergraduate GPA and GMAT scores. These correlations ranged from $-.08$ to $+.08$ and none reached statistical significance (all p values $> .29$), thereby indicating that ECI self-ratings were independent of academic performance and GMA.

3.4. Convergent validity

Table 2 presents the correlations between self-ratings on all four ECI clusters and LGD behaviors. These correlations were positive for self-awareness, self-management, social awareness, and social skills ($r = .17, .18, .25, .25$, all $p < .01$, respectively).

LGD behaviors were also related to neuroticism ($r = -.13, p < .05$), extraversion ($r = .15, p < .05$), agreeableness ($r = .13, p < .05$), and conscientiousness

($r = .20, p < .05$). The relationship between LGD behaviors and openness to experience approached significance ($r = .11, p = .07$). As we obtained an inter-rater agreement correlation of $.77$, we were also able to correct for unreliability in this outcome measure. These corrected correlations are also reported in Table 2 in parentheses.

3.5. Criterion-related validity

We next examined whether ECI self-ratings were related to work-related outcome measures (LGD nominations, AA-Promotions, and CRMS). We also examined the relationship between personality and these measures of work-related outcome measures. Table 2 presents these correlations.

3.1.1. LGD nominations

LGD nominations were positively related to ECI self-awareness ($r = .18, p < .01$), social awareness ($r = .16, p < .05$), and social skills ($r = .20, p < .01$). The correlation between LGD nominations and self-management was not significant ($r = .11, p = .08$).

LGD nominations were positively related to extraversion ($r = .12, p < .05$) and openness to experience ($r = .15, p < .05$) but were not significantly related to neuroticism ($r = -.05, p = .40$), agreeableness ($r = .03, p = .66$), or conscientiousness ($r = .06, p = .31$).

3.1.2. Age-adjusted number of promotions received

Self-ratings on all four ECI clusters were positively related to AA-Promotions ($r = .15, .21, .20$, and $.24$, all $p < .01$, for self-awareness, self-management, social awareness, and social skills, respectively).

AA-Promotions was also related to neuroticism ($r = -.17, p < .01$) and openness to experience ($r = .14, p < .05$) but was unrelated to extraversion ($r = .09, p = .10$), agreeableness ($r = .03, p = .59$), and conscientiousness ($r = .11, p = .06$).

Table 2. Correlations between NEO factors, ECI clusters and work-related outcomes

	Mean	SD	E	O	A	C	SA	SM	SocA	SS	ECI composite	LGD behaviors	LGD nominations	AA promotions	CRMS
N	18.50	8.05	-.41**	-.08	-.33**	-.37**	-.37**	-.47**	-.39**	-.42**	-.48**	-.13*	-.05	-.17**	-.20*
E	31.01	6.23	.28**	.34**	.34**	.27**	.47**	.38**	.38**	.57**	.53**	.15*	.12*	.09	.08
O	28.40	6.13	.10*	.10*	.30**	.06	.33**	.27**	.34**	.34**	.37**	.11	.15*	.14*	-.11
A	31.38	5.95		.24**	.26**	.24**	.22**	.24**	.24**	.22**	.27**	.13*	.03	.03	.14
C	36.02	6.24			.25**	.25**	.26**	.37**	.37**	.26**	.34**	.20*	.06	.11	.20*
SA	3.83	3.52					.51**	.50**	.50**	.54**	.74**	.17**	.18**	.15**	.11
SM	3.68	.36						.66**	.66**	.79**	.87**	.18**	.11	.21**	.17*
SocA	4.02	.38							.70**	.70**	.84**	.25**	.16*	.20**	.29**
SS	3.69	.43								.90**	.90**	.25**	.20**	.24**	.28**
ECI composite	3.81	.32										.26**	.22**	-.17**	.27**
LGD behaviors	3.71	.86											.25**	.07	.06
LGD nominations	.04	.89												.12	.14
AA promotions	.02	.95													.02
CRMS	3.78	.41													

Notes: ** $p < .01$, * $p < .05$. Corrected validities are reported in parentheses. N, neuroticism; E, extraversion; O, openness to experience; A, agreeableness; C, conscientiousness; SA, Emotional Competence Inventory (ECI) self-awareness; SM, ECI self-management; SocA, ECI social awareness; SS, ECI social skills; LGD nominations, leaderless group discussion (LGD) peer nominations; LGD-behaviors, EC behaviors demonstrated during LGD; AA promotions, age-adjusted promotions; CRMS, coworker ratings of managerial skills.

3.1.3. CRMS

Self-ratings on three ECI clusters were positively related to CRMS ($r = .17, p < .05$; $r = .29, p < .01$; $r = .28, p < .01$, for self-management, social awareness, social skills, respectively). The correlation between ECI self-awareness and CRMS was not significant ($r = .11, p = .19$).

CRMS was also related to neuroticism ($r = -.20, p = .01$) and conscientiousness ($r = .20, p = .01$), but was unrelated to extraversion ($r = -.08, p = .34$), openness to experience ($r = -.11, p = .16$), and agreeableness ($r = .14, p = .08$).

Having obtained an r_{wg} of .89 for the CRMS, we were able to correct these correlations for unreliability in this criterion measure. The corrected correlations are reported in parentheses in Table 2.

Taken together, these correlations provide some evidence concerning the criterion-related validity of ECI self-ratings for predicting work-related outcomes. That is, ECI self-ratings are positively related to several work-related outcomes including peer nominations following an LGD, promotions received, and coworkers' evaluations of participants' managerial skills. However, the correlations between ECI self-ratings and these work-related outcomes were generally small and it is noteworthy that each of these work-related outcomes was also significantly related to at least two personality factors (see Table 2). There were also small to moderate correlations between ECI self-ratings and self-ratings of personality. Hence, we conducted a series of hierarchical regression analyses to determine whether ECI self-ratings explained the unique variance in these work-related outcomes above and beyond any variance accounted for by personality.

In each of these hierarchical regression analyses, we entered age and personality (i.e., the NEO five-factor scores) in the first two steps of the analysis and then entered the four ECI clusters in the third step. We controlled for age because, consistent with Carson, Carson, and Birkenmeier (2000) and Goleman (1998c), we found significant positive correlations between age and all four ECI clusters ($r = .17, .22, .22, \text{ and } .23$, all $p < .01$, for self-awareness, self-management, social awareness, and social skills, respectively). We did not control for undergraduate GPA or GMAT scores because, as noted above, ECI self-ratings were unrelated to these measures of academic performance and GMA. The results of these hierarchical regression analyses are presented in Table 3. After controlling for age and personality, the relationship between ECI self-ratings and LGD nominations approached but did not reach significance ($\Delta R^2 = .03, p < .10$). ECI self-ratings were unrelated to AA-Promotions after controlling for age and personality. ECI self-ratings explained 12% of the variance in CRMS after controlling for age and personality ($\Delta R^2 = .12, p < .01$).

Table 3. Results of hierarchical regression analyses: combined Big-Five factors

	LGD nominations		AA promotions		CRMS		LGD behaviors	
	R ²	ΔR ²	R ²	ΔR ²	R ²	ΔR ²	R ²	ΔR ²
1. Age	.018	.018*	.045	.045**	.022	.022 ^a	.073	.073
2. NEO five factors	.045	.027	.082	.037*	.122	.100*	.089	.016
3. ECI clusters	.076	.031 ^a	.100	.018	.241	.119**	.097	.008

Notes: ** $p < .01$, * $p < .05$, ^a $p < .10$. ECI, Emotional Competence Inventory; AA promotions, age-adjusted promotions; LGD nominations, leaderless group discussion (LGD) peer nominations; LGD behaviors, EC behaviors demonstrated during LGD; CRMS, coworker ratings of managerial skills.

We also wanted to consider the incremental validity of the ECI in relation to each of the Big-Five personality factors independent of the others. For these hierarchical regression analyses, we entered age in the first step and then one of the NEO five-factor scores (e.g. agreeableness) in the second step. The four ECI clusters were then entered in the third step. A total of twenty separate regressions were run, one for each of the Big-Five in relation to each of the four outcome measures. For each of the Big-Five factors, the ECI provided an increased contribution to prediction of one or more outcome measures. The results of these analyses are reported in Table 4.

4. Discussion

The ECI was developed principally to capture Goleman's (1998a) widely known, mixed-model view of EI. Consistent with other research on mixed models and self-report measures of EI, we found that ECI self-ratings had small to moderate correlations (.22–.57) with the Big-Five dimensions of personality. However, our confirmatory factor analysis showed that the factor structure of ECI was distinct from the factor structure of the Big-Five personality dimensions, thereby providing some evidence concerning the discriminant validity of ECI self-ratings. Also consistent with previous research, we found no relationship between ECI self-ratings and academic performance or GMA.

We also found some evidence for the convergent validity of ECI self-ratings. That is, ECI self-ratings were significantly related to judges' ratings of EC behaviors demonstrated during a LGD. However, because the magnitude of these correlations was quite small (.17–.25), the data provide only weak evidence of convergent validity.

With respect to criterion-related validity, we found that ECI self-ratings had positive, albeit small (.11–.29), correlations with several measures of work-related outcomes. It is noteworthy that these correlations did not suffer from same-source bias (as would be the case when a self-report ECI measure is correlated with self-reports of life satisfaction, e.g., Law, Wong, & Song,

2004). Although ECI self-ratings did not predict two of the three criteria *after* controlling for personality and age, they did explain significant variance (12%) in coworkers' ratings of managerial skills after controlling for personality and age.

Taken together, these results are unlikely to satisfy either proponents or critics of Goleman's view of EI. First, although the factor structure of ECI appears to be distinct from the factor structure of the Big-Five personality dimensions, there is nonetheless a good deal of overlap between ECI self-ratings and personality. Second, correlations examining convergent validity were statistically significant but quite small in magnitude. Third, although ECI self-ratings had small, positive relationships with several criteria of work-related outcomes, these relationships (with one exception) disappeared after controlling for personality and age.

4.1. Limitations and directions for future research

Matthews, Zeidner, and Roberts (2003) noted that it is likely that ECI will have some utility because it assesses so many disparate concepts. Indeed, this may explain the relatively strong correlation between ECI self-ratings and coworkers' ratings of managerial skills (which included ratings of influence, motivating others, resolving conflicts, and teamwork) in the present study. But Matthews, Zeidner, and Roberts (2003) also point out that more sophisticated techniques exist for assessing many of the competencies comprising ECI. Future research should examine the relationship between ECI and other measures of these constructs, as well as whether ECI is a better predictor of work-related criteria than these other measures.

This study examined only self-ratings on ECI. Van Rooy and Viswesvaran's (2004) meta-analysis found the validity of others' rating of EI (.24) to be nearly identical to the validity of self-report EI measures (.23). Still, to the extent that people are poor judges of their own emotional competencies, self-ratings may be poor indicators of EI and related competencies. It would be helpful for future research to examine 360° ratings on ECI to determine whether such ratings are independent of personality and GMA. It will also be important for

Table 4. Results of hierarchical regression analysis for individual Big-Five factors

Criteria	Data entry order	N	E	O	A	C
AA promotions	ΔR^2 NEO	.019*	.025	.039*	.039*	.039*
	ΔR^2 age ΔR^2 ECI clusters	.039*	.007	.034*	.028	.044*
LGD nominations	ΔR^2 NEO	.001	.049*	.014	.014	.014
	ΔR^2 age ΔR^2 ECI clusters	.001	.014	.035	.036*	.051*
LGD behaviors	ΔR^2 NEO	.006	.041*	.072*	.072*	.072*
	ΔR^2 age ΔR^2 ECI clusters	.006	.020*	.028	.040*	.043*
CRMS	ΔR^2 NEO	.034*	.081*	.009	.133*	.096*
	ΔR^2 age ΔR^2 ECI clusters	.009	.006	.014	.009	.034*

Notes: For each analysis, age was entered on the first step of the regression model, the relevant NEO factor was entered on the second step of the model, and the four Emotional Competence Inventory (ECI) clusters were entered on the third step. Values in the table represent the increase in R^2 at each step of the analysis. For example, age explained 3.9% of the variance in promotions, neuroticism explained an additional 1.9% of the variance in promotions, and the four ECI clusters explained an additional 2.5% of the variance. * $p < .05$. N, neuroticism; E, extraversion; O, openness to experience; A, agreeableness; C, conscientiousness; AA, promotions; age-adjusted promotions; LGD, nominations; leaderless group discussion (LGD) peer nominations; LGD behaviors, EC behaviors demonstrated during LGD; CRMS, coworker ratings of managerial skills.

any ECI studies based on 360° ratings to examine the extent of overlap between ECI and other 360° rating instruments. It is noteworthy that ECI assesses a number of competencies (e.g., adaptability, initiative, service orientation, developing others, leadership, influence, conflict management, teamwork and collaboration) that are very similar to skills assessed by other 360° rating instruments. Stated differently, proponents of ECI must demonstrate that ECI 360° ratings are reasonably independent of ratings from other well-known 360° rating instruments (Leslie & Fleenor, 1998).

Also, the validity of EI might differ depending on the type of job (Van Rooy & Viswesvaran, 2004). Future research can examine the predictive validity of ECI and other EI measures for jobs that differ in terms of intellectual and interpersonal demands. For example, EI measures might be more related to jobs that require interpersonal skill and empathy (e.g., sales and other customer contact jobs, team leadership) than jobs that do not (e.g., software development, engineering).

Finally, we believe that future research needs to compare the criterion-related validity of mixed-model measures of EI (such as ECI) and ability-model measures of EI (such as MSCEIT). Only then will we understand the relative value of these measures for predicting work-related criteria.

References

- Ackerman, P.L., Kanfer, R. and Goff, M. (1995) Cognitive and Noncognitive Determinants and Consequences of Complex Skill Acquisition. *Journal of Experimental Psychology: Applied*, **1**, 4, 270–304.
- Ashkanasy, N.M. and Daus, C.S. (2005) Rumors of the Death of Emotional Intelligence in Organizational Behavior are Vastly Exaggerated. *Journal of Organizational Behavior*, **26**, 4, 441–452.
- Bar-On, R. (1997) *Bar-On Emotional Quotient Inventory: A measure of emotional intelligence*. Toronto: Multi-Health Systems, Inc.
- Barrick, M.R. and Mount, M.K. (1991) The Big Five Personality Dimensions and Performance: A meta-analysis. *Personnel Psychology*, **44**, 1–26.
- Barrick, M.R., Stewart, G.L., Neubert, M.J. and Mount, M.K. (1998) Relating Member Ability and Personality to Work-Team Processes and Team Effectiveness. *Journal of Applied Psychology*, **83**, 377–391.
- Bentler, P.M. (1990) Comparative Fit Indexes in Structural Models. *Psychological Bulletin*, **10**, 238–246.
- Boyatzis, R.E. (1994) Stimulating Self-Directed Change: A required MBA course called managerial assessment and development. *Journal of Management Education*, **18**, 3, 304–323.
- Boyatzis, R.E. (1998) *Transforming Qualitative Information: Thematic analysis and code development*. Thousand Oaks: Sage.
- Boyatzis, R.E. (2002) *Thematic Coding – ECI competencies*, private communication 03/11/02.

- Boyatzis, R.E., Baker, A., Leonard, D., Rhee, K. and Thompson, L. (1995) Will it Make a Difference?: Assessing a value-based, outcome oriented, competency-based professional program. In: Boyatzis, R.E., Cowen, S.S. and Kolb, D.A. (eds), *Innovation in Professional Education: Steps on a journey from teaching to learning*. San Francisco: Jossey-Bass, pp. 167–204.
- Boyatzis, R.E., Goleman, D. and Rhee, K. (2000) Clustering Competence in Emotional Intelligence: Insights from the emotional competence inventory. In: Bar-On, R. and Parker, J.D.A. (eds), *The Handbook of Emotional Intelligence*. San Francisco: Jossey-Bass.
- Boyatzis, R.E., Leonard, D., Rhee, K. and Wheeler, J.V. (1996) Competencies Can be Developed, But Not the Way We Thought. *Capability*, **2**, 2, 25–41.
- Brackett, M.A. and Mayer, J.D. (2003) Convergent, Discriminant, and Incremental Validity of Competing Measures of Emotional Intelligence. *Personality and Social Psychology Bulletin*, **29**, 1147–1158.
- Byrne, B.M. (1998) *Structural Equation Modeling with LISREL, PRELIS, and SIMPLIS: Basic concepts, applications, and programming*. Mahwah: Lawrence Erlbaum.
- Carson, K.D., Carson, P.P. and Birkenmeier, B.J. (2000) Measuring Emotional Intelligence: Development and validation of an instrument. *The Journal of Behavioral and Applied Management*, **2**, 1, 32–44.
- Caruso, D.R. (2003) Defining the Inkblot Called Emotional Intelligence. *Issues in Emotional Intelligence*, **1**, 1 [on-line serial], available at www.eiconsortium.org.
- Caruso, D.R. and Salovey, P. (2004) *The Emotionally Intelligent Manager: How to develop and use the four key emotional skills of leadership*. San Francisco: Jossey-Bass.
- Cherniss, C. (2000, April). *Emotional Intelligence: What it is and why it matters*. Paper presented at the Annual Meeting of the Society for Industrial and Organizational Psychology, New Orleans, LA.
- Cherniss, C. and Goleman, D. (eds.) (2001) *The Emotionally Intelligent Workplace: How to select for, measure, and improve emotional intelligence in individuals, groups, and organizations*. San Francisco: Jossey-Bass.
- Ciarrochi, J., Chan, A. and Caputi, P. (2000) A Critical Evaluation of the Emotional Intelligence Construct. *Personality and Individual Differences*, **28**, 539–561.
- Ciarrochi, J., Chan, A., Caputi, P. and Roberts, R. (2001) Measuring Emotional Intelligence. In: Ciarrochi, J., Forgas, J.P. and Mayer, J.D. (eds) *Emotional Intelligence in Everyday Life: A scientific inquiry*. Philadelphia, PA: Psychology Press, pp. 25–45.
- Cohen, J. (1988) *Statistical Power Analysis for the Behavioral Sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Conte, J.A. (2005) A Review and Critique of Emotional Intelligence Measures. *Journal of Organizational Behavior*, **26**, 433–440.
- Cooper, R.K. (1997) Applying Emotional Intelligence in the Workplace. *Training and Development*, **51**, 12, 31–38.
- Cooper, R.K. and Sawaf, A. (1998) *Executive EQ: Emotional intelligence in leadership and organizations*. New York: Berkley Publishing Group.
- Costa, P.T., Jr and McCrae, R.R. (1992) *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) Professional Manual*. Odessa, FL: Psychological Assessment Resources, Inc.
- Daus, C.S. and Ashkanasy, N.M. (2003 October) Will the Real Emotional Intelligence Please Stand Up? On deconstructing the emotional intelligence 'debate'. *The Industrial Organizational Psychologist*, **41**, 2, 69–72.
- Davies, M., Stankov, L. and Roberts, R.D. (1998) Emotional Intelligence: In search of an elusive construct. *Journal of Personality and Social Psychology*, **75**, 989–1015.
- Dawda, D. and Hart, S.D. (2000) Assessing Emotional Intelligence: Reliability and validity of the Bar-on emotional quotient inventory (EQ-I) in university students. *Personality and Individual Differences*, **28**, 797–812.
- Derksen, J., Kramer, I. and Katzko, M. (2002) Does a Self-Report Measure for Emotional Intelligence Assess Something Different than General Intelligence? *Personality and Individual Differences*, **32**, 37–48.
- Drasgow, F. and Kanfer, R. (1985) Equivalence of Psychological Measurement in Heterogeneous Populations. *Journal of Applied Psychology*, **70**, 4, 662–680.
- Emmerling, R.J. and Cherniss, G. (2003) Emotional Intelligence and the Career Choice Process. *Journal of Career Assessment*, **11**, 2, 153–167.
- Frey, M.C. and Detterman, D.K. (2004) Scholastic Assessment or g?: The relationship between the scholastic assessment test and general cognitive ability. *Psychological Science*, **15**, 373–378.
- George, J.M. (2000) Emotions and Leadership: The role of emotional intelligence. *Human Relations*, **53**, 1027–1055.
- Goleman, D. (1995) *Emotional Intelligence*. New York: Bantam Books, Inc.
- Goleman, D. (1998a) *Working with Emotional Intelligence*. New York: Bantam Books.
- Goleman, D. (1998b) What Makes a Leader? *Harvard Business Review*, **76**, 6, 92.
- Goleman, D. (1998c) The Emotionally Competent Leader. *The Healthcare Forum Journal*, **41**, 2, 36–38.
- Goleman, D. (2000) Leadership that Gets Results. *Harvard Business Review*, March–April, 78–90.
- Goleman, D. (2001) An EI-Based Theory of Performance. In: Cherniss, C. and Goleman, D. (eds.), *The Emotionally Intelligent Workplace: How to select for, measure, and improve emotional intelligence in individuals, groups, and organizations*. San Francisco: Jossey-Bass, pp. 27–44.
- Goleman, D., Boyatzis, R.E. and McKee, A. (2002) *Primal Leadership: Realizing the power of emotional intelligence*. Boston: Harvard Business School Press.
- James, L.R., Demaree, R.G. and Wolf, G. (1984) Estimating Within-Group Interrater Reliability with and without Response Bias. *Journal of Applied Psychology*, **69**, 85–98.
- James, L.R., Demaree, R.G. and Wolf, G. (1993) R_{wg} : An assessment of within-group interrater agreement. *Journal of Applied Psychology*, **78**, 306–309.
- Judge, T.A., Bono, J.E., Ilies, R. and Gerhardt, M.W. (2002) Personality and Leadership: A qualitative and quantitative review. *Journal of Applied Psychology*, **87**, 765–780.
- Kane, J.S. and Lawler, E.E. (1978) Methods of Peer Assessment. *Psychological Bulletin*, **85**, 555–586.
- Kozlowski, S.W.J. and Hattrup, K. (1992) A Disagreement about Within-Group Agreement: Disentangling issues of

- consistency versus consensus. *Journal of Applied Psychology*, **77**, 161–167.
- Landy, F.J. (2005) Some Historical and Scientific Issues Related to Research on Emotional Intelligence. *Journal of Organizational Behavior*, **26**, 411–424.
- Law, K.S., Wong, C. and Song, L.J. (2004) The Construct and Criterion Validity of Emotional Intelligence and Its Potential Utility for Management Studies. *Journal of Applied Psychology*, **89**, 483–496.
- Leslie, J.B. and Fleenor, J.W. (1998) *Feedback to Managers: A review and comparison of multi-rater instruments for management development*. Greensboro, NC: Center for Creative Leadership.
- Locke, E.A. (2005) Why Emotional Intelligence is an Invalid Concept. *Journal of Organizational Behavior*, **26**, 425–431.
- Lord, R.G., De Vader, C.L. and Alliger, G.M. (1986) A Meta-Analysis of the Relation Between Personality Traits and Leadership Perceptions: An application of validity generalization procedures. *Journal of Applied Psychology*, **71**, 402–410.
- Lynn, G.S., Reilly, R.R. and Akgün, A.E. (2000) Knowledge Management in New Product Teams: Practices and outcomes. *IEEE Transactions on Engineering Management*, **47**, 2, 221–231.
- MacCann, C., Matthews, G., Zeidner, M. and Roberts, R. (2003) Psychological Assessment of Emotional Intelligence: A review of self-report and performance-based testing. *International Journal of Organizational Analysis*, **11**, 247–274.
- Mathieu, J.E. and Farr, J.L. (1991) Further Evidence for the Discriminant Validity of Measures of Organizational Commitment, Job Involvement, and Job Satisfaction. *Journal of Applied Psychology*, **76**, 127–133.
- Mathieu, J.E., Hofmann, D.A. and Farr, J.L. (1993) Job Perception-Job Satisfaction Relations: An empirical comparison of three competing theories. *Organizational Behavior and Human Decision Processes*, **56**, 370–387.
- Matthews, G., Zeidner, M. and Roberts, R. (2003) *Emotional Intelligence: Science and myth*. Cambridge, MA: The MIT Press.
- Mayer, J.D. (1999) Emotional Intelligence: Popular or scientific psychology? *APA Monitor Online*, **30**, 8, 2.
- Mayer, J.D. and Salovey, P. (1993) The Intelligence of Emotional Intelligence. *Intelligence*, **17**, 4, 433–442.
- Mayer, J.D., Salovey, P. and Caruso, D. (2000) Competing Models of Emotional Intelligence. In: Sternberg, R.J. (Ed.), *Handbook of intelligence* (pp. 396–420). Cambridge, UK: Cambridge University Press.
- Mount, M.K., Barrick, M.R. and Stewart, G.L. (1998) Five-Factor Model of Personality and Performance in Jobs Involving Interpersonal interactions. *Human Performance*, **11**, 145–165.
- Murensky, C.L. (2000). *The Relationship Between Emotional Intelligence, Personality, Critical Thinking Ability, and Organizational Leadership Performance at Upper Levels of Management*. Dissertation, George Mason University.
- Pérez, J.C., Petrides, K.V. and Furnham, A. (2005) Measuring Trait Emotional Intelligence. In: Schulze, R. and Roberts, R.D. (eds.), *International Handbook of Emotional Intelligence*. Cambridge, MA: Hogrefe & Huber, pp. 181–201.
- Petrides, K.V., Pérez, J.C. and Furnham, A. (2003, July). The Trait Emotional Intelligence Questionnaire (TEIQue). A measure of emotional self-efficacy. In: E. J. Austin & D. H. Saklofske (Chairs), *Emotional intelligence*. Symposium conducted at the 11th Biennial Meeting of the International Society for the Study of the Individual Differences. Graz, Austria.
- Saklofske, D.H., Austin, E.J. and Minski, P.S. (2003) Factor Structure and Validity of a Trait Emotional Intelligence Measure. *Personality and Individual Differences*, **34**, 707–721.
- Sala, F. (2002) *Emotional Competence Inventory (ECI): Technical manual*. Boston, MA: Hay Group.
- Schmidt, F.L. and Hunter, J. (2004) General Mental Abilities in the World of Work: Occupational attainment and job performance. *Journal of Personality and Social Psychology*, **86**, 1, 162–173.
- Steiger, J.H. (1990) Structural Model Evaluation and Modification: An interval estimation approach. *Multivariate Behavioral Research*, **25**, 173–180.
- Thingujam, N.S. (2002) Emotional Intelligence: What is the evidence? *Psychological Studies*, **47**, 54–69.
- van der Zee, K., Thijs, M. and Schakel, L. (2002) The Relationship of Emotional Intelligence with Academic Intelligence and the Big Five. *European Journal of Personality*, **16**, 103–125.
- Van Rooy, D.L. and Viswesvaran, C. (2004) Emotional Intelligence: A meta-analytic investigation of predictive validity and nomological net. *Journal of Vocational Behavior*, **65**, 1, 71–95.
- Van Rooy, D.L., Viswesvaran, C. and Pluta, P. (2005) An Evaluation of Construct Validity: What is this thing called emotional intelligence? *Human Performance*, **18**, 4, 445–462.
- Walker, A.G. and Smither, J.W. (1999) A Five-Year Study of Upward Feedback: What managers do with their results matters. *Personnel Psychology*, **52**, 393–423.
- Whetten, D.A. and Cameron, K.S. (2005) *Developing Management Skills*. Upper Saddle River, NJ: Prentice Hall.