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The influence of emotional intelligence on performance

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Abstract

Emotional intelligence (EI; the ability to perceive, integrate, understand, and manage emotions) may influence appraisals of stressful tasks and subsequent task performance. This study examined the relationship of ability-based EI facets with performance under stress. We expected high levels of EI would promote challenge appraisals and better performance, whereas low EI levels would foster threat appraisals and worse performance. Undergraduates ($N = 126$) performed mental math and videotaped speech tasks. Certain dimensions of EI were related to more challenge and enhanced performance. Some EI dimensions were related to performance after controlling for cognitive ability, demonstrating incremental validity. This pattern of findings differed somewhat for males and females.

Keywords: Emotional intelligence; Cognitive appraisals; Performance

1. Introduction

Recent research suggests that emotional intelligence is important for work settings (Carmeli, 2003; Jordan, Ashkanasy, Hartel, & Hooper, 2002) and classrooms (Miller et al., submitted for publication; Petrides, Frederickson, & Furnham, 2004). Emotional intelligence (EI) refers to emotional skills involving accurately perceiving and expressing emotions, integrating emotions with cognitive processes, understanding emotions and their implications for various situations, and

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managing emotions (Mayer & Salovey, 1997). Research on EI has been limited by debates over conceptualization and measurement (Davies, Stankov, & Roberts, 1998). Some adhere to a theoretical model where EI consists of emotional abilities (e.g., Mayer, Caruso, & Salovey, 1999). Others suggest EI encompasses a variety of emotional skills, including aspects of personality (e.g., Bar-On, 1997; Goleman, 1995). The former are ability-based models and the latter are mixed (Mayer, Caruso, & Salovey, 2000) or trait-based models (Petrides & Furnham, 2000). The present is among the first to investigate the influence of ability-based EI on performance (see also Day & Carroll, 2004) and stressor appraisals.

1.1. Stressor appraisals

Stress is defined by how individuals evaluate themselves in relation to their environment (Lazarus & Folkman, 1984). Threat appraisals result when situational demands are believed to exceed available coping resources, whereas challenge appraisals result when adequate resources are believed to outweigh situational demands. Threat and challenge appraisals are associated with different behavioral and physiological outcomes (Tomaka, Blascovich, Kelsey, & Leitten, 1993) and affective responses (Schneider, 2004): challenged individuals exhibit physiological challenge, better task performance, and more positive and less negative affect than those threatened. Factors promoting challenge might enhance working conditions and outcomes.

1.2. EI and challenge appraisals

Emotional perception, facilitating cognition, emotional understanding, and emotional management are the four dimensions of EI (Mayer & Salovey, 1997). Emotional perception (EP) involves the ability to notice emotions accurately in the self and environment, and to express them well in social settings. Emotional perception should aid in discriminating between environmental threats and benefits. This facet may be important for adapting to stressors by directing attention toward stress-related cues in the environment. Facilitating cognition (FC) involves using and generating emotions to assist cognitive processes. Individuals proficient at integrating emotions and cognition may use positive emotions to foster creativity (Isen, Daubman, & Nowicki, 1987), process information heuristically and more effortlessly (Schwarz, 1990), and use negative emotions to maintain attentional focus when needed (Bless, Bohner, Schwarz, & Strack, 1990). The experiential area of EI, comprised by EP and FC, includes perceiving and using emotions without requiring an understanding of them (Mayer, Salovey, & Caruso, 2000).

The strategic EI area is comprised of understanding and managing emotions (Mayer et al., 2000). Emotional understanding (EU) involves identifying emotions, being clear about ways they are formed and blend, and their causes and consequences. Being able to understand emotions helps individuals identify (label) their emotions. Understanding emotions should reduce unproductive emotion-focused coping (i.e., reduce rumination) and facilitate problem- or emotion-focused coping facilitating adaptation. Emotional management (EM) involves maintaining and altering emotions in the self and others (enhancing positive or reducing negative emotions as needed; Mayer & Salovey, 1997). The ability to alter affective responses may confer stress benefits, particularly in the latter stages of stress (Schneider & Lyons, submitted for publication).

Emotions are an integral aspect of the stress process (Lazarus & Folkman, 1984). While all EI abilities may benefit stress responses, the strategic area (EU and EM) may be most beneficial. During a stressor, EU may facilitate identifying the source of stress responses (including affect) more quickly, which can direct attention away from distress and toward coping. Individuals who can manage their emotions may be able to alter or maintain emotions as needed to facilitate adaptive stress responses. Several studies have examined trait-based EI and stress. Trait-based EI is related to active coping (Salovey, Stroud, Woolery, & Epel, 2002) and less distress in managers (Slaski & Cartwright, 2002). Research on ability-based EI and stress is lacking. However, research suggests that ability-based EI (including EU and EM) promotes challenge patterns of affective and physiological stress responses (Schneider & Lyons, submitted for publication). The present study examined the influence of ability-based EI on stressor appraisals and performance.

1.3. EI and performance

Research has demonstrated that trait-based EI enhances performance in interviewing (Fox & Spector, 2000), management (Slaski & Cartwright, 2002), academics (Miller et al., submitted for publication; Petrides et al., 2004), and teams (Jordan et al., 2002), and on cognitive tasks (Shutte, Schuettpelz, & Malouff, 2001) and contextual performance (Carmeli, 2003). However, less research has examined ability-based EI and performance. Day and Carroll (2004) examined the relationship between the different facets of ability-based EI and performance on a decision-making task. They found EP alone was related to better performance (Day & Carroll, 2004). Other research found individuals giving speeches were rated more positively when their emotional expression, one aspect of EP, matched the emotional valence of the message delivered (Newcombe & Ashkanasy, 2002). These studies suggest that EP should facilitate task performance.

Emotions can influence thought processes by promoting different information processing strategies (Forgas, 1995; Schwarz, 1990). For example, positive emotions tend to promote heuristic processing (Schwarz, 1990)[1] and may be useful for creative tasks (Isen et al., 1987) and short-term memory tasks (Gray, 2004), whereas negative emotions promote deeper processing (Bless et al., 1990; Schwarz, 1990) and better spatial task performance (Gray, 2004). Emotion and cognition can be integrated to influence performance on a variety of tasks (Gray, 2004). Consequently, individuals high in FC may perform better on various tasks. The experiential area, which consists of EP and FC, may exert a stronger influence on performance than the strategic area.

1.4. Purpose and hypotheses

The purpose of this study was to examine the influence of the four ability-based EI dimensions on stress appraisals and performance. We hypothesized that all EI dimensions would be related to challenge appraisals, especially those facets comprising the strategic area (EU and EM). We hypothesized that all EI dimensions would be related to task performance, especially those facets comprising the experiential area (EP and FC).

[1] Positive emotions may promote heuristic processing particularly when individuals interact with an unfamiliar situation and are not motivated by biased search strategies (see Forgas, 1995).

Another purpose of this study was to investigate the incremental validity of EI in predicting performance. Critics of EI suggest that the best way to demonstrate the value of EI is to demonstrate its incremental validity beyond traditional predictors of performance (Landy, in press). Industrial/organizational psychologists have examined the relationship between general mental ability (GMA) and performance (see Hunter & Hunter, 1984; Schmidt & Hunter, 1998). GMA is often the best predictor of job performance (Schmidt & Hunter, 1998). EI represents a form of cognitive ability, but one that is distinct from GMA (Mayer et al., 1999). Research has shown that trait-based EI predicts academic performance beyond GMA (Miller et al., submitted for publication). However, little is known about the incremental validity of ability-based EI in predicting performance. We predicted that ability-based EI dimensions would demonstrate incremental validity beyond GMA when predicting appraisals and task performance.

2. Method

2.1. Participants

Undergraduate psychology students ($N = 126$) attending a midwestern university participated in this study in exchange for partial course credit. They were told the purpose of the study was to investigate how emotions affect people's feelings and thoughts. The average age was 20 ($SD = 4.60$; range = 18–47). Sixty percent of the sample was female and most were freshman (67%). The sample was primarily Caucasian (70%), followed by African–American (25%) and Asian (2%).

2.2. Stimuli

2.2.1. Mental arithmetic task

Participants performed a mental arithmetic task where they were required to count backwards by sevens, starting from a four-digit number, as quickly and as accurately as possible. The experimenter provided an example of responding that emphasized speed, sharpness, and accuracy.

2.2.2. Speech task

Participants were required to give a speech, assuming the role of manager, to rectify a loss of productivity in their work area and provide solutions to control conflict among employees. The task was adapted from Saab, Matthews, Stoney, and McDonald (1989). After the first 10 participants, the speech task was revised because it appeared to elicit less threat than the math task. The revised task required participants to assume the role of a manager, but they were informed that an employee had accused them of sexual harassment. Their task was to develop and present a speech in front of their boss (a video camera) to defend their actions. To intensify task ambiguity, they were not given details about the incident. The accusation of sexual harassment made the speech task more similar to that used by Saab et al. (1989). Participants were given 2 min to develop and 3 min to present their speech. If participants stopped talking, an experimenter prompted them to continue (e.g., "Can you provide any more information about what you have already said?").

2.3. Materials

2.3.1. Emotional intelligence

The MSCEIT V2.0 is a 141-item, ability-based measure of EI with four subscales to assess each dimension of EI (Mayer et al., 2000). Emotional perception (EP) includes a faces task (participants identify emotions depicted in faces) and a pictures task (participants label emotions represented in landscapes or art), where emotion terms (e.g., happiness, fear, surprise, disgust, and excitement) are rated on 5-point scales (1 = none, 5 = extreme) (alpha = .91). Facilitating cognition (FC) consists of a synesthesia task (participants compare emotions to sensations) and a facilitation task (participants rate the usefulness of specific emotions in different situations). Emotions are rated on 5-point scales (1 = not alike, 5 = very much alike, and 1 = definitely not useful, 5 = definitely useful, respectively) (alpha = .90). Emotional understanding (EU) consists of a blends task (participants represent various emotions with a single emotional construct) and a changes task (participants identify the product of conflicting emotions) (alpha = .77). Emotional management (EM) has two aspects. Participants read vignettes and answer questions about how a person's actions in a vignette affect (a) that character's emotions (emotional management) or (b) the emotions of other characters' in the vignette (social management) (alpha = .87). Scores for our participants were obtained from the test publisher, and the alphas above were obtained from the test manual (Mayer et al., 2000).

2.3.2. Cognitive appraisals

A two-item scale assessed appraisals. Items were: how threatening do you expect the upcoming task to be (situational demands), and how able are you to handle the burden of the task (coping resources). The items were combined in a ratio (demands/coping) as in past research (Schneider, 2004). Higher ratios denote more threat.

2.3.3. Performance

We indexed performance on the mental arithmetic task by obtaining the number of incorrect responses and the number of correct responses. Performance in the videotaped speech was determined by speech effectiveness, content, and confidence ratings. The effectiveness ratings comprised the following behaviors: eye contact, task completion, talking versus reading from notes, clear speaking, and the number of prompts required during the task. The content ratings were coded on the extent to which participants had clear ideas, were creative, used complete sentences, used effective problem-solving, and had organized ideas. The confidence ratings included an absence of laughing/excessive smiling, lack of stuttering, no expressions of verbal self-doubt, not being distracted, calmness, and use of firm voice. Each rater received 3 hours of training consisting of reviewing the definitions for each domain, viewing randomly selected videotape examples, and discussion among raters. Three trained raters viewed and rated each videotaped speech. Intraclass correlations were computed to assess reliability for each performance dimension (effectiveness = .91, content = .87, and confidence = .88).[2]

[2] Two of the three raters were used to rate the last 49 participants, *r*s = .84, .76, and .83 for effectiveness, content, and confidence, respectively.

2.4. Procedure

After obtaining consent, participants completed the MSCEIT V2.0 online. Participants were then run individually in the experimental room, a sound-deadened chamber. The chamber contains an unobtrusive ceiling-mounted video camera, audio speakers, and an intercom system for communication and monitoring. After completing demographics, participants were randomly assigned to receive either the mental arithmetic or the speech task first, and order was counterbalanced. Appraisals were assessed immediately after task instructions, before the task commenced. Participants then performed the first task. After a 2-min recovery period, instructions for the second task were administered, followed by appraisal assessment. Then, participants performed the second task. Following a 2-min recovery, participants were fully debriefed.

3. Results

The bottom of Table 1 presents the mean EI scores for males (M) and females (F). As can be seen, females appear to have higher scores on all EI dimensions, but only EM was significantly different, $t(124) = -2.65$, $p < .01$. This is consistent with past research which has found sex differ-

Table 1
Means, standard deviations, and correlations among emotional intelligence, math performance, speech performance, and appraisals, by sex

	EP	FC	EU	EM	MM	MC	EFF	CNT	CNF	SAP	MAP
EP		.40**	.25*	.42**	−.11	.03	.13	.16	.03	−.08	.01
FC	.54**		.34**	.48**	−.14	.03	.08	.09	.06	−.21†	−.07
EU	.28†	.38**		.32**	−.24*	.15	−.03	−.03	−.06	.04	−.06
EM	.34*	.42**	.25†		−.07	.18	−.07	−.06	−.10	.07	−.06
MM	−.24†	−.27†	−.10	−.16		−.14	.27*	.24*	.22†	−.09	.09
MC	.10	.32*	.34*	.16	−.08		−.03	−.03	−.09	.31**	−.30**
EFF	−.09	−.06	.30*	−.08	.13	.34*		.91**	.87**	−.03	.07
CNT	−.01	−.06	.30*	−.02	.17	.35*	.89**		.80**	−.04	.16
CNF	−.04	−.13	.17	−.07	.06	.38**	.88**	.85**		.03	.07
SAP	−.20	−.04	−.13	−.20	−.09	−.27†	−.34*	−.36*	−.38**		.09
MAP	−.19	−.09	−.24†	−.39**	−.10	−.34*	−.27†	−.23	−.29*	.66**	
Means											
M	95.83	92.41	87.63	87.73^{a}	3.31	25.00^{a}	3.61	3.63	3.70	.88	.71^{a}
F	100.23	97.20	90.47	92.59^{b}	3.86	14.27^{b}	3.51	3.52	3.26	1.13	1.06^{b}
SD											
M	16.16	15.52	8.30	10.27	3.00	13.41	1.43	1.32	1.45	.74	.46
F	14.80	14.42	8.85	10.04	3.72	11.29	1.32	1.17	1.20	.71	.81

Notes: $^{\dagger}p < .10$. $^{*}p < .05$. $^{**}p < .01$. ^{a,b} Different superscripts denote significant differences. EP = emotional perception, FC = facilitating cognition, EU = emotional understanding, EM = emotional management, MM = math mistakes, MC = math correct, EFF = effectiveness rating, CNT = content rating, CNF = confidence rating, SAP = speech appraisal, MAP = math appraisal. Values for males (M) ($n = 51$) are shown in the bottom left side of the table and values for females (F) ($n = 75$) are shown in the upper right side of the table.

ences in ability-based EI (Day & Carroll, 2004; Kafetsios, 2004). Consequently, subsequent analyses were conducted by sex. Task order was counterbalanced effectively across sex ($\chi^2(1) = .48$, ns).[3] We also examined sex differences in performance. Table 1 shows that males gave significantly more correct math responses, $t(124) = 4.82$, $p < .01$, and were more challenged by the math task, $t(124) = -2.79$, $p < .01$, than females.

Table 1 presents correlations among all the variables for males and females. For males (bottom left), EP appeared to be related to fewer math mistakes, but not significantly. Facilitating cognition also appeared to be related to fewer math mistakes, but not significantly. However, FC was significantly related to giving more correct math responses, as expected. Emotional understanding was significantly related to giving more correct math responses, better speech effectiveness and better content ratings, as expected. While this dimension tended to be related to more challenge in response to the math task, the relation was not significant. Lastly, EM was significantly related to more challenge in response to the math task, as expected. Table 1 shows that for females (upper right), FC was not related to performance, but tended to be related to more challenge in response to the speech task, although this was not significant. Emotional understanding was significantly related to making less math mistakes, but not to appraisals.

To examine the incremental validity of EI, a proxy for GMA was created. Participants' high school ACT, SAT score, and college GPA were first standardized and then averaged.[4] Partial correlations were computed to examine the relation of the EI dimensions with performance and appraisals, controlling for GMA (see Table 2).[5] Emotional understanding was related to more correct math responses for males and females, as expected. Unexpectedly, the pattern of relationships between the experiential area dimensions of EI and speech performance differed by sex. Emotional perception and FC tended to be related to *worse* speech performance for males. This relationship was significant only for EP and effectiveness ratings, where males higher in EP gave a more ineffective speech. In contrast, EP and FC tended to be related to *better* speech performance for females. This relationship was significant only for EP and content ratings. Unexpectedly, for both males and females, EM tended to be related to worse speech performance across all ratings, although these relationships were significant only for males. Unexpectedly, none of the EI dimensions were related to appraisals when controlling for GMA.

4. Discussion

This study examined the influence of ability-based EI on stress appraisals and performance. We hypothesized that all EI dimensions would be related to challenge appraisals (especially EU and

[3] A MANOVA was conducted with order as the IV and the four EI dimensions as the DVs revealing no effects of order on EI, $F(4, 121) = 1.48$, ns. EI was equally represented across task order. A MANOVA was conducted with order as IV and math performance as the DV, $F(2, 121) = 2.18$, ns. A MANOVA was conducted examining the effect of order on speech performance, $F(3, 119) = 0.98$, ns. Order did not differentially affect EI or performance so subsequent analyses were collapsed across order.

[4] The GMA variable was only available for the last 49 participants, although one did not provide this data ($n = 48$).

[5] The EI dimensions were generally unrelated to the GMA proxy, with the exception of EU which was positively related with GMA, $r(48) = .32$, $p < .05$.

Table 2
Partial correlations among emotional intelligence, math performance, speech performance, and appraisals, by sex, controlling for cognitive ability

	Males				Females			
	EP	FC	EU	EM	EP	FC	EU	EM
MM	−.03	−.29	−.18	−.22	.22	.23	−.31	.14
MC	−.05	.10	.48*	−.07	−.07	−.03	.39*	.01
EFF	−.56*	−.38	.12	−.49*	.36†	.25	−.01	−.30
CNT	−.39	−.43†	.03	−.50*	.42*	.14	.01	−.25
CNF	−.44†	−.43†	−.05	−.52*	.24	.13	−.06	−.30
SAP	−.14	−.15	−.15	−.05	−.04	−.06	.24	.09
MAP	−.07	.01	−.12	−.08	−.02	.01	−.29	.26

Notes: †$p < .10$. *$p < .05$. EP = emotional perception, FC = facilitating cognition, EU = emotional understanding, EM = emotional management, MM = math mistakes, MC = math correct, EFF = effectiveness rating, CNT = content rating, CNF = confidence rating, SAP = speech appraisal, MAP = math appraisal. Values for males ($n = 16$) are shown on the left and values for females ($n = 25$) are shown on the right.

EM) and that all EI dimensions would be related to task performance (especially EP and FC). We predicted that ability-based EI would predict appraisals and performance beyond GMA.

4.1. Strategic area (EU and EM)

4.1.1. Appraisals

Emotional understanding and EM were expected to be related to challenge appraisals. Unexpectedly, EU was not significantly related to stressor appraisals, although it tended to be related to benign math appraisals for males. Emotional management was generally related to more challenge for males, although this was significant only for math appraisals. Consistent with past research, EM promotes challenge (Schneider & Lyons, submitted for publication), but only for males in the present research. EM was not related to the other variables. Surprisingly, when controlling for cognitive ability, the relationship between EM and math appraisals was no longer significant. Any benefit of EM for appraisals was removed when considering GMA. When accounting for cognitive ability, neither EU nor EM predicted appraisals.

4.1.2. Performance

We expected EU and EM to enhance task performance. For males, EU was significantly related to more accurate math responses, and delivering a speech more effectively and with better content. For females, EU was related to making fewer mistakes during the math task. EU enhanced performance. However, any benefit of EU on the speech task was eliminated after controlling for GMA. Although for both males and females, EU still predicted better math performance, as expected. These findings provide the first bit of evidence that EU can increment GMA when predicting performance. EM was not predictive of performance in bivariate analyses. However, after controlling for GMA, a pattern emerged between EM and speech performance that differed by

sex. For males, EM hampered delivering a speech about sexual harassment. Sexual harassment is an emotionally laden topic (Hotelling & Zuber, 1997). This task and/or topic may have promoted a focus on trying to manage emotions, distracting males' performance.

4.2. Experiential area (EP and FC)

4.2.1. Appraisals

We expected EP and FC to predict challenge appraisals. Neither EP nor FC predicted appraisals. However, there was a tendency for females higher in FC to be challenged by the speech task. Controlling for GMA, this tenuous relationship was eliminated. The experiential area dimensions did not predict appraisals. Past research has suggested that the strategic dimensions, EU and EM, may be more useful during the stress process (Schneider & Lyons, submitted for publication).

4.2.2. Performance

We expected the experiential dimensions to predict performance. Emotional perception was not related to performance, which is inconsistent with past research (Day & Carroll, 2004). However, FC predicted more accurate math responses for males, and tended to predict fewer math mistakes. The math task should require more detailed processing. Although males were less threatened by this task, if they were higher in FC they may have garnered the emotional resources needed to perform well on this task (Bless et al., 1990; Schwarz, 1990). FC was unrelated to speech performance, unexpectedly.

After controlling for GMA, EP significantly predicted and FC tended to predict speech performance but the direction differed by sex. For males, EP was significantly related to *poorer* effectiveness ratings and tended to predict *worse* confidence ratings. For females, EP significantly predicted *better* speech content and tended to predict *more* effectiveness. This pattern of sex differences was similar for FC, controlling for GMA. FC tended to predict *poorer* confidence and content ratings for males and was generally positively related (though not significantly) to performance for females. These sex differences for EP and FC may imply that males and females had different affective experiences in response to the speech task. The speech task required participants to defend themselves from an accusation of sexual harassment. Males and females differ in their attitudes towards sexual harassment; males are typically the perpetrators and females the victims (Hotelling & Zuber, 1997). The emotionally arousing nature of the speech task may have made males in this study defensive. A post hoc analysis revealed that males were more threatened by the speech task than the math task, $t(50) = -2.25$, $p < .05$, suggesting they may have been more defensive. Males higher in EP may have been especially aware of the emotions they experienced in response to this task, which may have hampered their ability to deliver a substantial speech.

4.3. Limitations and future research

There are several limitations of the present study. First, the correlational design of this study prevents inferences about causality. Experimental or prospective studies should help distinguish cause and effect. Second, this research examined responses to one kind of task, active coping tasks (Tomaka et al., 1993). Future research might use tasks that vary in stressfulness and shy away from those saturated with different sex-specific perceptions like sexual harassment, to more fully

ascertain the relation of ability-EI and performance. Third, study participants were college students engaged in laboratory research rather than employees engaged in work tasks. The nature of the active coping tasks used in the present study may not map onto actual work tasks. However, the workplace often requires individuals to engage in actively performing stressful tasks. As such, the dimensions of ability-based EI may benefit individuals' performance of tasks, depending on their nature. More research is needed that examines the role of ability-based EI on performance in actual work settings. The effects of EI may be stronger in the workplace due to its homogeneous nature (Schneider, 1987). Workplace settings are characterized by interpersonal interaction and conflict (Basch & Fisher, 2000), emotional aspects which may uncover new and interesting relationship between EI and performance.

In summary, this research contributes in numerous ways to the existing EI literature. First, the present study used an ability-based measure to assess the facets of EI. Ability-based EI measures represent the future of EI research given the questionable validity of many self-report measures (Davies et al., 1998). Second, this research demonstrated that specific dimensions of ability-based EI predict stressor appraisals and performance, but these relationships differed by sex. Finally, if EI measures are to be applied in the workplace, they must first demonstrate incremental validity (Landy, in press). This study provides some initial evidence of incremental validity for certain EI dimensions beyond GMA. This study indicates that EP and EU are related to performance for both sexes, beyond GMA. Contrary to claims in the popular literature (Goleman, 1995), these results should be replicated in the workplace before ability-based EI measures are used in the workplace.

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