

Emotional Intelligence and Emotional Creativity

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ABSTRACT Three studies examined the relationship between emotional intelligence (EI) and emotional creativity (EC) and whether each construct was predictive of creative behavior. It was hypothesized that the relationship between EI and EC corresponds to the relationship between cognitive intelligence and creative ability. Therefore, EI and EC were expected to be two distinct sets of abilities. Intercorrelations and confirmatory factor analyses supported the hypothesis. Furthermore, it was hypothesized that EC, but not EI, would correlate with behavioral creativity. Self-report measures of EC significantly correlated with laboratory and self-reported creativity measures in both studies, while ability measures of EC only correlated with self-reported artistic activity. EI was uncorrelated with creative behavior.

Intelligence is associated with one's level of academic achievement and the prestige of one's occupation. Creativity, on the other hand, is associated with the degree to which a person engages in novel endeavors. Both intelligence and creativity are considered mental abilities that can be measured with performance tests. Intelligence is the capacity to reason validly about a domain of information, and it typically requires converging on a single answer. In order to receive a high score on an intelligence test, a person's responses must satisfy a criterion of correctness. Creativity, on the other hand, requires

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generation of multiple alternatives that are both novel and appropriate (Lubart, 1994). Thus, to receive a high score on a test of creative ability, a person's responses must diverge from what is customary (Sternberg & O'Hara, 1999).

A number of theories have been proposed about the relations between intelligence and creativity. These theories postulate (a) that creativity is a subset of intelligence (Guilford, 1975); (b) that creativity and intelligence are related or partially overlapping constructs (Barron & Harrington, 1981); or (c) that creativity and intelligence are independent abilities (Wallach & Kogan, 1965). Empirically, across a number of studies, the correlation between intelligence and creative ability has been rather low (Runco & Albert, 1986; Torrance, 1975; Wallach & Kogan, 1965), supporting the notion that these constructs are mostly distinct mental abilities.

Over the last few decades, research on intelligence has expanded and now encompasses both verbal/analytic reasoning skills and domain specific skills, including emotion-related abilities. Emotional intelligence (EI), for instance, is defined as the ability to perceive emotions accurately, use emotions to enhance thinking, understand and label emotions, and regulate emotions in the self and others (Mayer & Salovey, 1997). Similar to cognitive intelligence, performance tests of EI require reasoning skills, and correct answers on such tests converge to specific criterion. For example, an item measuring Understanding Emotions, one component of EI, might ask people whether the meaning of optimism is closer to the anticipation of happy outcomes or to a lack regret, where the former is more accurate. Parallel to EI, at least one new domain of creativity has been introduced—emotional creativity. Emotional creativity (EC) is the ability to experience and express original, appropriate, and authentic combinations of emotions (Averill & Thomas-Knowles, 1991). Similar to performance measures of cognitive creativity, measures of EC require divergence from the norm. Whereas EI pertains to how a person reasons with emotions, EC pertains to the richness of a person's emotional life. As such, a person with high EI will have knowledge of and may use a variety of regulation strategies, whereas a person with high EC will experience more complex emotions. As an example, during an audition for a community musical theater, a person high in EI would recognize her emotions of tension and stress and regulate them in order to give the best performance. On the other hand, a person with high EC would, at the same time, be jealous of

people with greater musical talent, embarrassed by a realization of a flawed performance, and amused when reflecting on the seriousness of the people involved and the gravity one's own reaction.

Both EI and EC have been compared to cognitive abilities, such as verbal intelligence (Averill & Thomas-Knowles, 1991; Mayer, Salovey, Caruso, & Sitarenios, 2003), but, as yet, they have not been studied in relation to each other. The question arises as to whether the relationship between EI and EC is parallel to that of cognitive intelligence and creativity. That is, will these two abilities be mostly uncorrelated, or will they be more highly related?

Both EI and EC may be related to creative behavior. In one study, EC was related to behavioral creativity that involved expression of emotion (e.g., writing a love narrative; Gutbezahl & Averill, 1996). EI might also be associated with creativity. One component of EI is the ability to use emotions to facilitate thought processes (Mayer, 2001; Mayer & Salovey, 1997), such as when directing one's efforts into activities best performed in certain emotional states (e.g., Palfai & Salovey, 1993). Another EI ability concerns the regulation of emotion to reduce negative or maintain positive emotions. Positive emotions can then enhance creativity by increasing flexibility and breadth of thinking (e.g., Estrada, Isen, & Young, 1994; Isen, 1999; Isen, Daubman, & Nowicki, 1987; Isen, Johnson, Mertz, & Robinson, 1985).

The purpose of this research is to: (a) contribute to the construct validation of EI and EC by jointly testing their structure and (b) investigate whether each construct predicts creative behavior. In Study 1, we compare measures of EI and EC and correlate them with creativity on a laboratory poetry-writing task (Amabile, 1985). In Study 2, we replicate the relations between EI and EC and examine how they relate to self-reported creative behavior in the arts. Finally, in Study 3 we use confirmatory factor analysis to test the model of EI and EC as distinct abilities.

Background

Cognitive Intelligence and Creativity

Both intelligence and creativity include mental abilities but differ in the mental operations involved in these abilities. Intelligence is the ability to successfully solve problems that require analytical thinking in response to well-defined tasks, while creative ability refers to originality and fluency of ideas on open-ended tasks (Getzels &

Csikszentmihalyi, 1972; Guilford, 1975). These different kinds of mental operations lead to different kinds of test responses (Mayer, 2004). High-quality answers on an intelligence test include one or a small set of answers satisfying a criterion of correctness or goodness. For example, one subtest on the WAIS asks for similarities between familiar objects, such as an orange and a banana. The test manual lists a small number of acceptable answers, such as that both an orange and a banana are fruits. On the other hand, high-quality responses on tests of creative ability include multiple ideas that are also original. For example, Wallach and Kogan's (1965) tests include a subtest parallel to the *Similarities* on the WAIS. One item asks how are milk and meat alike. A common and, therefore, low-creativity response would be that milk and meat come from animals, while an original and high-creativity response would be that they are government inspected (Wallach & Kogan, 1965).

Several theoretical models attempt to describe the relationship between intelligence and creativity; these include conceptions of creativity as a subset of intelligence (Guilford, 1975), creativity and intelligence as related or partially overlapping (Barron & Harrington, 1981), and creativity and intelligence as independent or disjoint constructs (Wallach & Kogan, 1965). There is some support for each of the proposed theoretical models; advocates of each model, however, adopt different definitions of creativity. When creativity is assessed through ratings of real-life professional achievement, over the total range of creativity and intelligence the correlation between the two is around .40, supporting the model of partially overlapping constructs (Barron, 1963; Eysenck, 1995). Hayes (1989) proposed that this correlation is a by-product of a social structure that enables expression of creativity more readily in work settings that require advanced educational degrees (e.g., in science). When creativity is assessed by performance tests, the correlation between the two is much lower, supporting the model of disjoint constructs. For example, a review of 388 correlations between intelligence and creative ability showed that the correlation between these measures ranged from .06 to .21 (Torrance, 1975; see also Getzels & Jackson, 1962; Richards, 1976; Runco & Albert, 1986; Wallach & Kogan, 1965).

The validity of intelligence and creative ability has also been investigated in relation to criteria of creative behavior. Intelligence only weakly correlates with creative accomplishment, with r s from $-.05$ to $.30$ (e.g., Hocevar, 1980). Although creative artists and

scientists have higher than average intelligence, above a certain level, intelligence ceases to be a significant predictor of creative achievement (Barron & Harrington, 1981). Tests of creative ability are more successful in predicting real-life creative accomplishment, with correlations ranging from .22 to .53 (for creativity ratings by teachers or psychologists; e.g., Barron, 1955; Guilford & Hoepfner, 1971; and for self-reports of creative activity; e.g., Guastello, Bzdawka, Guastello, & Rieke 1992; King, Walker, & Broyles, 1996; Torrance, 1988).

Emotions and Creativity

Creativity is also related to a number of emotional traits. For instance, creative accomplishment in the arts is related to affective disorders. Prevalence rates of affective disorders in samples of eminent artists range from 38%–43%, as compared to 2%–8% in the general population (Andreasen, 1987; Jamison, 1989). Several studies suggested that the primary reason for the relationship between affective disorders and creativity might be in the experience of strong positive emotions or mild manic states. Positive or hypomanic moods increase awareness and enhance breadth and flexibility of thinking. People put in a positive mood produce more original word associations (Isen et al., 1985) and perform more successfully on tests of creative ability (Estrada et al., 1994; Isen et al., 1987) than people put in negative or neutral mood states. Furthermore, students who score higher on trait hypomania describe themselves as unique and creative and report engaging in more artistic or fantasy activities (Eckblad & Chapman, 1986; Schuldberg, 1990).

Emotional Intelligence and Emotional Creativity

In the last decade, EI and EC have been introduced to describe emotional abilities. Emotional intelligence pertains to how an individual reasons about and with emotions; it includes four component abilities (or branches): the perception, use, understanding, and regulation of emotion (Mayer & Salovey, 1997). Perception of Emotions is the ability to accurately identify emotional content in faces and pictures. Use of Emotions concerns the utilization of emotion as information to assist thinking and decision making. Understanding Emotions involves adequately labeling emotions and understanding

their progression. Finally, Regulation of Emotion pertains to effective managing of feelings in oneself and others to enhance well-being in self and others.

The four branches of EI can be reliably measured with a performance test, the Mayer-Salovey-Caruso Test of Emotional Intelligence (MSCEIT; Mayer, Salovey, & Caruso, 2002). Similar to tests of cognitive intelligence, the MSCEIT requires analytical thinking and convergence of answers to either of two criteria of correctness. The consensus criterion is based on the proportion of respondents in the normative sample who endorsed each test item, while the expert criterion is based on judgments made by 21 members of the International Society for Research on Emotions (Mayer et al., 2003).

Emotional creativity is the ability to experience and express novel and effective blends of emotions (Averill & Thomas-Knowles, 1991). There are three criteria for EC (Averill, 1999a, 1999b): novelty (i.e., variations of common emotions and generation of new emotions specific to the individual), effectiveness (i.e., appropriateness for the situation or beneficial consequences for the individual or a group), and authenticity (i.e., honest expression of one's experiences and values). An additional condition for EC is emotional preparedness, which reflects a person's understanding of emotions and willingness to explore emotions. EC can be assessed by performance tests and a self-report inventory (Averill & Thomas-Knowles, 1991). Criteria for success on the performance tests require divergence from the ordinary emotional experience, and the self-report inventory has three subscales assessing self-perception of three components relevant to EC: Emotional Preparedness, Novelty, and Effectiveness/Authenticity.

Both EI and EC combine emotions and intellect in ways that are beneficial for the individual. However, the two abilities differ in the cognitive processes they evoke and the criteria used in their measurement. While EI requires analytical ability and convergence to one best answer to an emotional problem, EC involves the ability to diverge from the common and generate a novel emotional reaction. As an example, a person high on EI would use his knowledge about mood influences on performance and choose to engage in a creative task when in a positive mood (Isen, 1999). In contrast, a person high on EC might, at the same time, find inspiration in the pain of negative emotions, comfort in writing about these experiences, and excitement in the process of creation (Averill & Thomas-Knowles, 1991).

Comparing EI and EC is an important and even necessary step in their validation. Studies in predictive validity of these abilities suggest that they are related to different criteria in behavior and personality. Emotional intelligence is distinguishable from verbal intelligence but moderately related to it (Brackett & Mayer, 2003; Brackett, Mayer, & Warner, 2004; Lopes, Salovey, & Straus, 2003; Mayer, Caruso, & Salovey, 1999). Also, EI is associated with more positive social interactions and is inversely related to illicit drug and alcohol use, and aggression (e.g., Brackett & Mayer, 2003; Brackett et al., 2004). Emotional creativity is largely unrelated to cognitive intelligence (Averill & Thomas-Knowles, 1991) and is significantly correlated with a greater number of emotional experiences (such as traumatic events and daily hassles and disappointments) and creativity in laboratory tasks requiring expression of emotion (e.g., writing a love narrative and making an expressionistic drawing; Averill, 1999a; Gutbezahl & Averill, 1996).

Furthermore, EI and EC have been studied in relation to personality traits and shown to be distinguishable by their personality correlates. Similar to cognitive intelligence, EI only weakly correlates with personality traits (Brackett & Mayer, 2003; Brackett et al., 2004). Most consistently, EI is related to Agreeableness (*r*s between .20 and .25 over different studies; Mayer, Salovey, & Caruso, 2004). Both EI and Agreeableness address emotional attributes that contribute to the quality of social relationships, but they also have some important differences. Emotional intelligence refers to successful reasoning about emotions but does not imply an interest or willingness to apply this skill in a relationship context, and Agreeableness concerns a social orientation of cooperativeness and caring but does not have to be based in accurate perception and reasoning with emotions. On the other hand, EC is more strongly correlated with personality traits (Averill, 1999a). Most centrally, the Novelty component of EC is moderately to highly correlated with Openness to Experience. In addition, Extraversion correlates with self-perceived Effectiveness, an aspect of EC that emphasizes open expression of emotion in social settings, and Neuroticism positively correlates with Novelty and negatively with Effectiveness (Averill, 1999a).

To date, no study explicitly concerned the relationship between EI and EC. Averill (1999a) suggested that the relationship between EI and EC should correspond to the relationship between cognitive intelligence and creativity. One theoretical prediction could be that EC

is a component of EI (i.e., EC is a subset of EI). This prediction would be supported if EI and EC define a common higher order latent dimension. Another theoretical prediction is that EI and EC are partially overlapping abilities. This hypothesis would be supported if EI and EC could be modeled as two correlated latent dimensions. The final theoretical prediction is that EI and EC are two distinct sets of abilities. This hypothesis would be supported if EI and EC can be represented by independent or weakly correlated factors. Empirical research offers the strongest support to the theory describing cognitive intelligence and creativity as disjoint constructs. Therefore, we hypothesized that EI and EC should be distinct and only weakly correlated.

Emotional abilities can also be related to creativity. Emotional intelligence might enable a person to become aware of relationships between mood and performance and to direct their efforts into activities best suited for certain emotional states (e.g., Palfai & Salovey, 1993). Also, EI enables a person to maintain or increase positive moods and can thus indirectly be involved in enhancing creative thinking (e.g., Isen, 1999). However, in order to obtain a high score on the test of EI, one has to conform to a criterion of correctness about appropriate emotional reactions, which may impose constraints on originality. For example, substantial evidence supports the idea that, at least for some individuals, negative, rather than positive, moods might be associated with greater creativity (Post, 1996; Walker, Koestner, & Hum, 1995). This ability to use emotions in unconventional ways (i.e., creating in negative rather than positive moods) is not captured by tests of EI. Thus, EI measured by standard tests is not likely to correlate with behavioral creativity. On the other hand, EC enriches the emotional experience that can be expressed in original work. The relationship between EC and behavioral creativity should therefore be significant.

Introduction to the Present Studies

Three studies will examine the relationship between EI and EC and their predictive validity in relation to behavioral creativity. The first two studies will employ measures of EI and EC to examine their interrelations and then examine their associations with creative behavior. In Study 1, the criterion for creativity will be a laboratory task requiring participants to write a poem with emotional content (Amabile, 1985). In Study 2, the same measures of EI and EC will be

used but with a new criterion pertaining to reports of artistic activity and interest. Finally, in Study 3, data from the previous two studies will be combined and confirmatory factor analysis will be used to test the hypothesis that EI and EC are distinct mental abilities.

STUDY 1

The purpose of Study 1 is to (a) test the hypothesis that EI and EC mirror the relationship between cognitive intelligence and creative ability and (b) examine the relationship of EI and EC with the Big Five personality traits and behavioral creativity. We hypothesized that EI and EC are disjoint abilities; thus, we predict that they would be nonsignificantly, or only weakly, related. The only significant correlation is expected between EI and the Emotional Preparedness component of EC since they both require emotional knowledge. Furthermore, validity of EI and EC is examined in relation to Big Five personality traits and behavioral creativity. We expect that EI will show significant, but low, correlations with Agreeableness, while EC will correlate most strongly with Openness to Experience. Study 1 extends earlier research on EC by employing a criterion of poetry writing in a laboratory setting. The task asks for a poem with emotional content, and thus it is expected to be significantly related to EC (Gutbezahl & Averill, 1996) but not to correlate significantly with EI.

Methods

Participants

Participants ($N = 107$) were undergraduate students recruited through the introductory psychology subject pool at the University of New Hampshire. There were 34 males, 68 females, and 5 who did not report their gender. Participants were predominantly Caucasian (88.8%), between 17 and 49 years old ($M = 19$). Subjects signed an informed consent and received course credit for their participation.

Measures

Ability Measure of Cognitive Creativity

Consequences. Consequences is a subtest from the Torrance Tests of Creative Thinking (Torrance, 1974). Participants are presented with four hypothetical situations and asked to generate possible consequences of the target event (e.g., “What would happen if people could turn invisible

at will?”). They are then asked to produce as many answers as possible and instructed to be creative in their responses. The test is scored for fluency (i.e., total number of responses) and originality (i.e., number of unique responses). A total score on Consequences is computed by summing z-scores on fluency and originality ($\alpha = .77$).

Remote Associates Test (RAT). The RAT (Shames, 1994) tests the ability to make connections between distant ideas. Subjects are presented three words and asked to respond with a fourth word that connects the three stimuli (e.g., “root”, “belly”, and “barrel” with a remote associate “beer”). The test is scored for the total number of correct responses. In the present study a 30-item version of the test was administered ($\alpha = .84$).

Emotional Creativity

Emotional Consequences (Averill & Thomas-Knowles, 1991). Emotional Consequences presents participants with emotionally salient hypothetical situations and asks them to produce numerous possible consequences to these situations (e.g., “What would happen if people would fall in love with a different person every day?”). Participants are instructed to be creative. The test is scored for fluency and originality of responses. A total score on Emotional Consequences is computed by summing z-scores on fluency and originality ($\alpha = .75$).

Emotional Triads (Averill & Thomas-Knowles, 1991). The Emotional Triads Test presents participants with four sets of three dissimilar emotions (e.g., serene/bewildered/impulsive). Subjects are asked to imagine and describe a situation in which they experienced all three of these emotions simultaneously. Responses to items on the Emotional Triads Test were rated for overall emotional creativity using Amabile’s (1982) consensual assessment technique. Three upper-level undergraduate research assistants served as judges. Emotional creativity was defined as originality and effectiveness of the described experience in each story. The EC score for the Triads was computed by averaging the ratings across three judges (inter-rater reliability was .73; four-item scale reliability $\alpha = .87$).

Emotional Creativity Inventory (ECI; Averill, 1999a). The ECI is a 30-item self-report questionnaire. Scores are provided for Emotional Preparedness (e.g., “I think about and try to understand my emotional reactions”; $\alpha = .81$), Novelty of Emotional Experiences (e.g., “I have felt combinations of emotions that other people have probably never experienced”; $\alpha = .84$), and Effectiveness of experienced emotions (e.g., “The way I experience and express my emotions helps me in my relationships with others”; $\alpha = .82$), as well as an overall EC score.

Emotional Intelligence

Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT). Emotional intelligence ability was measured with the MSCEIT (Mayer et al., 2002). The test contains eight tasks and 141-items that ask a respondent to solve emotional problems pertaining to four abilities (branches): (a) perception of emotions, (b) using emotions to facilitate thinking, (c) understanding emotions, and (d) regulation of emotion. The test publisher provides five scores—one for each branch and a total score. As reported in the technical manual, the split-half reliabilities for branch scores are between .76 and .90, and .93 for the total EI.

Cognitive Intelligence

Self-reported verbal and mathematics SAT scores were used as proxy measures of cognitive intelligence, following research showing high correlations between these scores and tests of cognitive intelligence (Frey & Detterman, 2004).

Behavioral Creativity

American Haiku (Amabile, 1985). Behavioral creativity was assessed by Amabile's American Haiku task. Unlike the measures of creative ability that ask a person to respond to decontextualized items (e.g., RAT), this task asks for generation of a product (a short poem) similar to those produced by creative artists. Therefore, this task can be considered more ecologically valid and is often used as a measure of creative behavior (Amabile, 1996; Lubart & Sternberg, 1995). Subjects were asked to write a five-line, nonrhymed poem, following a series of steps: (a) the first line is a specified noun; (b) the second line consists of two adjectives describing the noun; (c) the third line includes two verb forms; (d) the fourth line is a free phrase; and (e) the fifth line repeats the noun from the first line. The first line of the poem was "commitment." Subjects were given instructions on how to write an American haiku poem and were presented with two examples of completed poems that followed this format. Four upper class undergraduate research assistants rated the poems for the novelty of word choice and overall creativity using Amabile's (1982) consensual assessment technique. A creativity score was computed by averaging ratings across four judges (inter-rater reliability was .70).

Global Personality Traits

Big Five personality traits (Goldberg, 1992). Big Five traits were assessed by the unipolar adjective markers. The Big Five markers include

100 adjectives pertaining to Extraversion (e.g., talkative, assertive; $\alpha = .73$), Agreeableness (e.g., kind, pleasant; $\alpha = .74$), Conscientiousness (e.g., efficient, organized; $\alpha = .68$), Neuroticism (e.g., fearful, nervous; $\alpha = .60$), and Intellect/Openness to Experience (e.g., imaginative, introspective; $\alpha = .57$). The items were presented in alphabetical order and rated on a 5-point scale ranging from *Do not agree at all* to *Completely agree*.

Procedure

Data were collected in two 1-hour sessions. Measures administered in the first session included tests of EI and EC, and measures administered in the second session included the poetry-writing task, cognitive creativity tests, and personality trait scales. All measures were presented in a booklet and self-administered.

Results and Discussion

As noted earlier, the goal of Study 1 was to investigate the relationship between EI and EC and to examine whether these emotional abilities are related to creativity on a laboratory poetry-writing task. First, preliminary analyses individually examine measures of intelligence and creativity. Next, the relationship between EI and EC is explored. Finally, validity of EI and EC is examined in relation to global personality traits and creativity in writing poetry.

Intelligence and Creativity Measures Considered Individually

Intercorrelations among the subscales of intelligence and creativity were comparable to those obtained in previous research (see Table 1). MSCEIT branch scales were moderately correlated, r s from .17 to .50. Different measures of cognitive intelligence and creativity were rather weakly related, with correlations between verbal and math SAT scores $r = .36$ and between the RAT and Consequences $r = .13$. Low correlations between RAT and Consequences reflect the difference in abilities captured by the two tests. The RAT is a highly structured test that requires integration of remotely related concepts, more similar to tests of intelligence than ill-structured problems on tests of creative ability. Indeed, some research shows that RAT scores are more closely related to scores on tests of intelligence than other tests of creative ability (Sternberg & O'Hara, 1999). In the

Table 1
Intercorrelations Among Measures of Intelligence and Creativity (Study 1)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Cognitive intelligence														
1. SAT verbal														
2. SAT math	.36***													
Cognitive creativity														
3. Consequences	.16	.32**												
4. Remote associates	-.05	-.08	.13											
Emotional intelligence														
5. Perception of emotion	.12	-.13	-.13	-.06										
6. Using emotions	.21*	-.04	-.03	-.08	.50***									
7. Understanding emotions	.50***	.21*	.14	-.09	.31***	.34***								
8. Regulation of emotion	.17	-.20	-.09	-.03	.20*	.26**	.17							
9. Total	.34***	-.11	-.11	-.13	.74***	.73***	.62***	.57***						
Emotional creativity														
Ability measures														
10. Emotional consequences	-.11	.11	.51***	.17	.05	.05	.05	-.03	.03					
11. Emotional triads	.12	.02	.14	-.11	-.01	-.04	.18	.19	.08	.19				
Self-report inventory														
12. Preparedness	.17	.04	.07	.06	.04	.00	.22*	.09	.11	.04	.23*			
13. Novelty	.20	-.03	.22*	.27*	-.15	-.11	.10	.03	-.05	.14	.28**	.48***		
14. Effectiveness	-.13	-.10	.02	.14	.02	.06	-.04	.05	.04	.22* .02	.29**	.22*		
15. Total	.11	-.05	.16	.24	-.06	-.04	.11	.07	.02	.19	.25*	.73***	.83***	.65***

Note: * $p < .05$. ** $p < .01$. *** $p < .001$.

present study, the RAT was selected as one measure of creative ability to represent a wider variety of abilities theoretically and empirically related to creative thinking and so to strengthen the conclusions about the relation of EI and EC to cognitive measures of intelligence and creativity.

The subscales of the ECI were moderately correlated, $r_s = .22$ to $.48$. Correlations between two ability measures of EC had correlations similar to those observed for two tests of cognitive creativity, $r = .19$. Since the tests were designed to measure somewhat distinct abilities, the low correlations are not surprising. Consequences involve quantity and originality of responses, while Triads require an account of a single experience that synthesizes distant emotions. In this regard, the relationship between tests of Emotional Consequences and Emotional Triads should parallel the relationship between cognitive Consequences and the RAT.

Interrelations Among Intelligence and Creativity Measures

We hypothesized that EI and EC are distinguishable from cognitive intelligence and creativity abilities. Not surprisingly, the highest correlation between emotional and verbal intelligence was observed for the Understanding Emotions ability ($r = .50$). Both Understanding Emotions and verbal intelligence require an extensive vocabulary and thus have partial conceptual and method overlap in the way they are measured. Math SAT scores were largely unrelated to EI. As expected, Cognitive Consequences and Emotional Consequences were moderately correlated ($r = .51$). The correlation between the RAT and Emotional Triads was not significant.

In prior research, cognitive intelligence and cognitive creativity were only weakly correlated; we expected the same relations between EI and EC. The results of the present study supported this hypothesis (see Table 1). Correlations between cognitive intelligence and creativity were rather low, r_s between $-.08$ to $.32$. Correlations between EI and EC were comparable, with r_s in the range from $-.03$ to $-.13$ (all *ns*) for ability measures of EC, and $-.11$ to $.22$ for self-report scales of EC. In particular, the Emotional Preparedness component of EC was expected to correlate with Understanding of Emotions as they both require knowledge about emotions. This was the only significant correlation between EI and EC.

Validity of EI and EC in Relation to Big Five Personality Traits and Behavioral Creativity

Emotional intelligence is conceptualized and measured as an ability that is distinct from personality traits. As in previous research (Brackett & Mayer, 2003; Brackett et al., 2004; Lopes et al., 2003), correlations between EI and Big Five traits were low (all $r_s < .30$). Just two EI branches were significantly correlated with the Big Five (see Table 2); Agreeableness correlated with Perception of

Table 2
Correlations Between Intelligence and Creativity With Big Five Personality Traits and Behavioral Creativity (Study 1)

	Big Five Personality Traits					Creativity
	E	A	C	N	O	Haiku
Cognitive intelligence						
SAT verbal	.03	-.21	-.26*	.09	.10	.17
SAT math	.05	-.20	-.08	.07	-.08	.20
Cognitive creativity						
Consequences	-.14	-.18	-.13	.15	.02	.22*
Remote associates	.11	-.01	-.08	.07	.18	.23*
Emotional intelligence						
Perception of emotion	.09	.21*	.10	-.06	.03	.01
Using emotions	-.05	.17	.06	.03	.06	-.08
Understanding emotions	.03	-.08	-.03	.05	.24*	.12
Regulation of emotion	-.01	.05	-.05	.03	.15	.07
Total	.05	.10	.00	.01	.16	-.04
Emotional creativity						
Ability measures						
Emotional consequences	.03	-.03	-.02	.12	.05	.08
Emotional triads	-.02	.08	-.07	.00	.10	.17
Self-report inventory						
Preparation	.09	-.04	.05	.10	.12	.30**
Novelty	-.11	-.02	-.18	.27**	.35***	.30**
Effectiveness	.20	.28**	.33**	.10	.27**	.06
Total	.05	.10	.06	.23*	.36***	.30**
Behavioral creativity						
Haiku	.03	-.16	-.10	.10	.26*	

Note: * $p < .05$. ** $p < .01$. *** $p < .001$.

Emotions and Openness to Experience with Understanding Emotions ($r_s = .21$ and $.24$, respectively). Hypothesized correlations between EC and Openness to Experience and Neuroticism were supported. As shown in Table 3, Novelty was correlated with Openness to Experience ($r = .35$) and Neuroticism, $r = .27$. In addition, Effectiveness was correlated with Agreeableness and Conscientiousness ($r_s = .28$ and $.33$, respectively). Because of relatively low reliability coefficients for the Big Five scales, the obtained correlations are an underestimate of the true correlations.

Emotional intelligence was not expected to correlate with behavioral creativity. Emotional intelligence scores are based on consensus about the meaning of emotions, and this conformity of opinion and experience is not compatible with creativity. As expected, the relation between the two was nonsignificant. The present creativity task, writing a poem about commitment, asked for expression of emotions and thus was expected to significantly correlate with EC (Gutbezahl & Averill, 1996). Indeed, significant correlations were found between creativity in poetry writing and self-reported EC (Emotional Preparedness and Novelty, $r = .30$). Ability measures of EC were not significantly correlated with poem creativity, supporting the claim of some researchers that performance tests are less useful in predicting behavioral creativity than are self-report measures (Averill & Thomas-Knowles, 1991; Barron & Harrington, 1981).

Next, to examine the incremental validity of self-reported EC in prediction of behavioral creativity beyond global personality traits, multiple regression analyses were performed with Openness to Experience entered on Step 1 and the total score on the self-report EC inventory on Step 2. The overall model significantly predicted behavioral creativity ($R = .36$), with ECI significantly contributing to prediction beyond Openness (R^2 change = $.06$). This result suggests that EC, as assessed by the self-report inventory, is distinguishable from global personality traits. Of note in this study, Openness was measured by the adjective markers, a measurement that does not allow for generalization of these findings to questionnaire scales that specifically assess Openness to Feelings as a facet of global Openness to Experience. Study 2 will specifically address this explanation by employing a questionnaire measure of the Big Five.

Table 3
Intercorrelations Among Measures of Intelligence and Creativity (Study 2)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Cognitive intelligence														
1. SAT verbal														
2. SAT math	.58***													
Cognitive creativity														
3. Consequences	.08	.00												
4. Remote associates	.38***	.21*	.14											
Emotional intelligence														
5. Perception of emotion	.21	.13	-.14	.02										
6. Using emotions	.05	.02	.05	-.06	.42***									
7. Understanding emotions	.41***	.18	.15	.27**	.34***	.18								
8. Regulation of emotion	.17	.05	.04	-.08	.27**	.33***	.32***							
9. Total	.30**	.14	.03	.04	.81***	.66***	.60***	.62***						
Emotional creativity														
Ability measures														
10. Emotional consequences	.00	.01	.38***	.11	-.22*	-.11	-.01	.00	-.12					
11. Emotional triads	.38***	.16	.18	.28**	.09	.04	.16	.10	.16	.20*				
Self-report inventory														
12. Preparedness	.18	.05	.05	-.11	.21*	.09	.16	.18	.28**	.00	.18*			
13. Novelty	.28**	.02	.21*	-.06	-.09	-.04	.01	.01	-.05	.12	.23*	.32***		
14. Effectiveness	.01	.10	-.15	-.18	.19*	.14	.10	.10	.17	.00	-.10	.31***	-.01	
15. Total	.24*	.06	.10	-.17	.08	.06	.10	.11	.12	.07	.16	.69***	.79***	.54***

Note: * $p < .05$. ** $p < .01$. *** $p < .001$.

STUDY 2

The first purpose of Study 2 was to replicate relations between EI and EC. The second goal was to extend the investigation of criterion validity of EI and EC. As in Study 1, measures of cognitive intelligence and creative ability and Big Five personality traits were employed. In addition, new criteria for behavioral creativity were introduced. In the past, EC was investigated only in relation to laboratory measures of creativity (Gutbezahl & Averill, 1996). The present study explored EI and EC as they relate to self-initiated artistic activity (e.g., painting and exhibiting art in public) and artistic interest (e.g., seeing a play or visiting a museum).

Methods

Participants

Participants ($N = 113$) were undergraduate students enrolled in two sections of personality psychology at the University of New Hampshire. There were 28 males, 80 females, and 5 who did not report gender. Participants were predominantly Caucasian (95.4%), with modal age between 17 and 19 (participants reported age ranges, rather than exact ages). Data were collected as a part of a laboratory component of the course. Students signed an informed consent and received feedback on their scores on the Big Five traits and the Emotional Creativity Inventory as a part of educational experience in personality psychology.

Measures

Intelligence and Creativity Measures

The same measures of EI, EC, and cognitive creative ability were administered as in Study 1. We also obtained students' official SAT scores from the university registrar.

Global Personality Traits

NEO PI-R (Costa & McCrae, 1992). The Big Five personality traits were assessed with the 240-item NEO-PI-R. This inventory provides scores for five global traits—Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience—and 30 facet scores (6 facets for each global trait). Participants rated themselves on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The reliability of all NEO-PI-R scales was high (alphas between .87 for Openness and .91 for Neuroticism).

Behavioral Creativity

Artistic Activity and Artistic Expression and Appreciation Scales (Brackett, 2003). Items on these scales ask about specific instances of behavior in a specified period of time (e.g., how many times in the previous 2 weeks a person has practiced playing a musical instrument). The Artistic Activity scale included 10 items referring to visual arts and creative writing (e.g., painting, sculpting, writing a short story; $\alpha = .78$), and the Artistic Expression and Appreciation scale contained 11 items pertaining to involvement in performing arts and cultural events (e.g., seeing an opera or ballet, acting on stage, dancing in a production; $\alpha = .60$). While these scales have reliability coefficients that are somewhat lower than traditional self-report measures, they are nonetheless a valuable improvement in relation to single-item behavior assessments that are often used in research (e.g., Amabile, Hill, Hennessey, & Tighe, 1994).

Results and Discussion

As noted earlier, the purpose of the present study was to replicate relations between EI and EC and then to examine the relationship between these emotional abilities and real-life involvement in artistic activity. Preliminary analyses examine measures of intelligence and creativity. Then, the relationship between EI and EC is explored. Finally, validity of EI and EC is examined in relation to the Big Five traits and self-reported artistic activity and interest.

Intelligence and Creativity Measures Considered Individually

Interrelations among intelligence and creativity scales replicated those obtained in Study 1 (see Table 3). The four branch scales of EI were moderately correlated, r s from .18 to .42. The subscales of the ECI showed somewhat lower correlations than in Study 1, with r s from $-.01$ to .32. The measures of cognitive intelligence and creativity were weakly to moderately related, with correlations between subtests of the SAT $r = .58$ and between the RAT and Consequences $r = .14$ (n.s.). Correlations between two ability measures of EC were similar to those for two measures of cognitive creativity ability, $r = .20$.

Interrelations Among Intelligence and Creativity Measures

As in Study 1, the discriminant validity of EI and EC in relation to cognitive intelligence and creativity was supported. Understanding Emotions was moderately correlated with verbal SAT scores

($r = .41$), while the other branches of EI were not significantly related to verbal ability. Cognitive and emotional creativity measures were moderately correlated: $r = .38$ between Cognitive and Emotional Consequences and $r = .28$ between RAT and Emotional Triads. These correlations support the distinction between cognitive and emotional creativity abilities.

Correlations between cognitive intelligence and creativity were rather low, r s between $-.08$ to $.32$. As we hypothesized, EI and EC showed similar correlations: r s ranged from $-.22$ to $.16$ for ability measures of EC, and $-.05$ to $.28$ for self-report scales of EC. The Emotional Preparedness component of EC had the highest correlations with EI: r s = $.21$ and $.28$ with the Perception of Emotion and total EI, respectively. A significant negative correlation was observed between the Perception of Emotion and Emotional Consequences: $r = -.22$.

Validity of EI and EC in Relation to Big Five Personality Traits and Behavioral Creativity

The results replicated the general pattern of correlations obtained in Study 1. This is particularly significant considering that we used a different measure of personality traits and that this measure had substantially higher scale reliabilities. Emotional intelligence had low correlations with Big Five traits (r s $< .30$; see Table 4). Significant correlations were obtained between EI and Agreeableness and Conscientiousness (particularly Understanding Emotions and Regulation of Emotion branches, r s = $.19$ to $.28$). For EC, again the most prominent correlations were obtained with Openness to Experience (r s between $.20$ for Emotional Triads and $.54$ for the self-report Emotional Creativity Inventory). In addition, self-reported Effectiveness was positively correlated with Extraversion and Conscientiousness (r s = $.44$ and $.23$, respectively) and negatively correlated with Neuroticism ($r = -.29$).

As expected, EI was not related to behavioral creativity. However, several EC scales predicted self-initiated involvement in the arts. Artistic Activity was significantly related with Emotional Triads ($r = .23$), and both Artistic Activity and Artistic Expression and Appreciation were related to the self-report inventory of EC ($r = .26$). These results extend the earlier findings on the relationship between EC and creativity in the laboratory and suggest that EC plays a role in self-initiated artistic activity.

Table 4
Correlations Between Intelligence and Creativity With Big Five Personality Traits and Behavioral Creativity (Study 2)

	Big Five Personality Traits					Creativity	
	E	A	C	N	O	Activity	Appreciate
Cognitive intelligence							
SAT verbal	.22*	.08	.13	.10	.31**	.25*	.25*
SAT math	.03	.10	.12	-.09	.25*	.25*	.06
Cognitive creativity							
Consequences	.07	-.14	-.04	.18	.20*	-.06	.19
Remote associates	-.21*	.05	.05	.05	-.12	.14	-.06
Emotional intelligence							
Perception of emotion	.07	.16	.09	-.05	.12	.03	-.04
Using emotions	.09	.01	.17	-.11	-.07	-.12	-.12
Understanding emotions	-.04	.11	.24**	-.01	.12	.10	.10
Regulation of emotion	.19*	.28**	.19*	.00	.13	.00	.09
Total	.11	.21*	.23*	-.06	.10	-.02	-.03
Emotional creativity							
Ability measures							
Emotional consequences	.12	-.12	-.04	-.07	.11	-.04	.12
Emotional triads	-.05	.09	.05	.06	.20*	.23*	.08
Self-report inventory							
Preparation	.15	.16	.20*	.02	.38***	.18	.22
Novelty	-.06	-.06	-.06	.21*	.52***	.18	.14
Effectiveness	.44***	.16	.23*	-.29**	.15	.18	.25**
Total	.21*	.08	.13	.02	.54***	.26**	.26**
Behavioral creativity							
Artistic activity	.15	.18	.16	-.17	.45***		.19*
Appreciation/expression	.24*	.24*	.09	-.11	.19*		

Note: * $p < .05$. ** $p < .01$. *** $p < .001$.

The incremental validity of self-reported EC in prediction of behavioral creativity beyond global personality traits was examined in a multiple regression analysis. As in Study 1, Openness to Experience was entered on Step 1, and total scores on the self-report ECI were entered on Step 2. The overall model significantly predicted behavioral creativity ($R = .49$ for Artistic Activity and $R = .29$ for Artistic Expression and Appreciation). However, unlike in Study 1, the ECI did not significantly contribute to prediction beyond Openness (R^2 change $< .02$). These results suggest that EC, as assessed by a self-report inventory, is not distinguishable from global personality traits in the prediction of behavioral creativity. In this study, Openness was measured by the NEO-PI-R, which includes a facet scale of Openness to Feelings that bears considerable similarity with Novelty component of EC. Alternatively, it is possible that the ECI contributes to unique prediction of criteria for behavioral creativity only when creativity specifically includes expression of emotions, as was the case with the poetry-writing task in Study 1.

STUDY 3

The first two studies obtained only low correlations between EI and EC, supporting the hypothesis that they are distinct emotional abilities. In Study 3, we investigate the structural and discriminant validity of EI and EC through confirmatory factor analyses. The goal of these analyses is to (a) demonstrate that EC ability can be empirically distinguished from cognitive creative ability; (b) model the structure of EC as a set of related abilities and traits; and (c) validate the theoretical relationship between EI and EC as two disjoint sets of abilities. To obtain a sufficiently large sample for these analyses, samples from the first two studies will be combined.

Results and Discussion

All analyses were conducted using maximum likelihood estimation procedure in Amos 4.0 (Arbuckle, 1999). Theoretically defined models were compared to a model trying to fit all observed variables on a single factor. The underlying assumption of the maximum likelihood estimation is a multivariate normality distribution of the data. Since many data sets do not satisfy this assumption (Micceri, 1989; Russell, 2002), it is necessary to examine the data for violations of this assumption. Therefore, data were tested for deviations from

multivariate normality and the observed deviations corrected using the Bollen-Stine bootstrapping procedure implemented in Amos (Bollen & Stine, 1993; Nevitt & Hancock, 2001). Models were evaluated by several goodness-of-fit indices, including χ^2 , goodness of fit index (GFI), adjusted goodness-of-fit index (AGFI), nonnormed fit index (NNFI, called also Tucker-Lewis index, TLI), and root mean square error of approximation (RMSEA). Goodness of fit is assessed using cutoff criteria proposed by Hu and Bentler (1999). Table 5 shows the correlation matrix for all variables included in the structural equation model analyses.

Distinguishing Between Emotional and Cognitive Creativity Abilities

In order to establish the construct validity of EC, this ability first has to be distinguished from cognitive creative ability. As Studies 1 and 2 demonstrated, emotional and cognitive creativity assessed by the Consequences and Emotional Consequences showed moderately high correlations. The strictest test of discriminant validity between emotional and cognitive creativity abilities would involve a comparison of these tests that showed highest intercorrelations. Two confirmatory factor analysis models were compared. The first model attempted to fit all observed variables on one factor of general creative ability (Model 1A), and the second factor fitted indicators of emotional and cognitive creativity abilities on two correlated factors (Model 1B).

Test of multivariate normality indicated significant deviations from this assumption, critical ratio = 11.42, $p < .001$. To correct for the observed multivariate nonnormality in the data, the models were evaluated using the Bollen-Stine bootstrap method for estimating the chi-square statistic. As indicated in Table 6, the model attempting to fit emotional and cognitive creativity on one general factor of creative ability (Model 1A) did not reach satisfactory fit as indicated by a significant chi-square value ($\chi^2 = 53.13$, $p < .001$) and other indices that were not in the acceptable ranges (GFI, AGFI, TLI less than .91; RMSEA = .10). Good fit was obtained for the model of two correlated factors of emotional and cognitive creative abilities (Model 1B; see Figure 1), as demonstrated by the insignificant chi-square value ($\chi^2 = 17.20$, $p = .58$) and other indices that exceed the suggested values for good fit (GFI, AGFI, TLI all greater than .95;

Table 5
Correlations and Variances for Measures Used in Confirmatory Factor Analyses

	Cognitive Creativity				Emotional Creativity								
	Cognitive Consequences				Emotional Consequences				Emotional Triads				
	CC1	CC2	CC3	CC4	EC1	EC2	EC3	EC4	ET1	ET2	ET3	ET4	
Cognitive Creativity													
Cog Conseq													
CC1	1.69												
CC2	.28***	1.69											
CC3	.21**	.36***	1.70										
CC4	.26***	.37***	.39***	1.69									
Emotional Creativity													
Em Conseq													
EC1	.13	.19*	.26***	.22**	1.67								
EC2	.17*	-.04	.08	.20*	.29***	1.67							
EC3	.10	.21**	.30***	.24**	.42***	.24**	1.68						
EC4	.09	.16*	.28***	.19*	.44***	.28***	.46***	1.68					
Emotional Triads													
ET1	.15	.06	.19*	.10	.19*	.03	.21**	.14	.94				
ET2	.11	.02	.20*	.06	.15	.04	.09	.09	.57***	1.04			
ET3	.15	.14	.17*	.06	.12	-.01	.11	.08	.50***	.64***	.90		
ET4	.10	.07	.12	.08	.13	.03	.08	.14	.51***	.59***	.60***	.86	
Em Creat Inven													
Preparation	.09	.00	-.03	.12	.03	.05	.08	.07	.07	.13	.18*	.07	
Effectiveness	-.11	-.09	-.11	-.02	.02	.09	.07	.15	-.01	-.02	-.04	-.05	
Novelty	.16	.08	.16	.12	.15	-.06	.11	.02	.20*	.19*	.27***	.12	
Emotional Intell													
Perception	.00	-.03	-.12	-.12	-.19*	-.05	-.13	-.17*	-.04	.01	.00	.00	
Use	.00	-.06	.04	.03	-.13	.05	-.06	-.05	.02	-.08	-.02	-.03	
Understanding	.09	.06	-.02	.03	-.06	.08	.03	.05	.04	-.01	.07	-.01	
Regulation	.04	-.01	-.05	-.04	-.02	.09	.02	-.01	.15	.02	.20*	.13	

	Emotional Creativity				Emotional Intelligence			
	Emotional Creativity Inventory							
	Prep	Effect	Novel	Percep	Use	Under	Regulat	
Cognitive Creativity								
Cog Conseq								
CC1								
CC2								
CC3								
CC4								
Emotional Creativity								
Em Conseq								
EC1								
EC2								
EC3								
EC4								
Emotional Triads								
ET1								
ET2								
ET3								
ET4								
Em Creat Inven								
Preparation	.68							
Effectiveness	.28***	.69						
Novelty	.39***	.09	.66					
Emotional Intell								
Perception	.03	.05	-.17*	14.73				
Use	-.01	.11	-.10	.40***	11.78			
Understanding	.20*	.02	.02	.27***	.26***	10.29		
Regulation	.08	.05	-.03	.24**	.33***	.31***	9.12	

Note: Values in the diagonal are scale variances.

CC1-4—Cognitive Consequences items; EC1-4—Emotional Consequences items; ET1-4—Emotional Triads items.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 6
Goodness-of-Fit Indices for the Confirmatory Factor Analyses Testing Models of Emotional and Cognitive Creativity, Structure of Emotional Creativity, and Relationship Between Emotional Intelligence and Emotional Creativity

Model	χ^2	df	<i>p</i> of χ^2	GFI	AGFI	TLI	RMSEA
Emotional and Cognitive Consequences							
Single factor of creative ability	53.13	20	.00	.91	.83	.75	.10
Two correlated factors	17.20	19	.58	.97	.95	1.01	.00
Emotional Creativity							
Single factor of EC	154.74	44	.00	.83	.74	.62	.13
Three correlated factors	34.59	41	.75	.96	.94	1.02	.00
Emotional Intelligence and Emotional Creativity							
General factor of emotional ability	268.34	90	.00	.76	.71	.52	.11
Four correlated factors	81.52	86	.62	.93	.91	1.01	.00

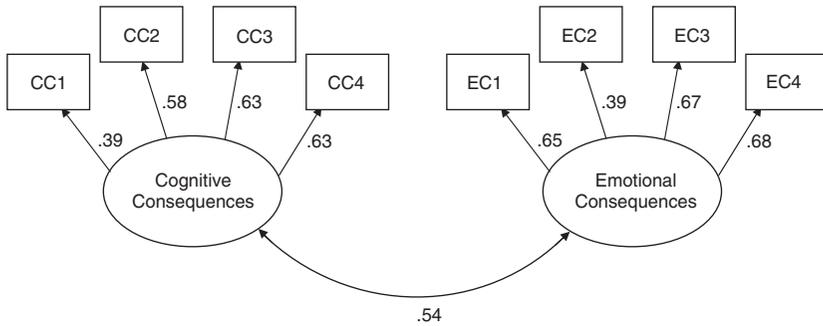


Figure 1

Confirmatory factor analysis model for emotional and cognitive creativity abilities (Model 1B).

RMSEA = .00). In general, these results support the distinction between emotional and cognitive creativity abilities.

Is Emotional Creativity One Unitary Ability?

In the past, the construct of EC has been examined employing both performance measures and a self-report inventory. However, there has been no research trying to test the structure of EC as assessed by all these measures. It is hypothesized that EC, similar to general creativity, is composed of a pattern of related cognitive abilities and personality attributes (sometimes called a “creativity syndrome”; Mumford & Gustafson, 1988). Thus, it was predicted that EC would be best described by three correlated factors of EC: (a) an Emotional Triads factor assessing the experience of unusual combinations of emotions; (b) an Emotional Consequences factor assessing emotional ideation; and (c) an Emotional Creativity Inventory factor measuring self-perceived preparedness, novelty, and effectiveness of emotional experiences. The structure of EC was tested by two confirmatory factor analysis models. The first model attempted to fit all observed variables on a single factor of emotional creativity (Model 2A). The second model defined three correlated factors of EC (Model 2B).

The data had significant deviations from the multivariate normality assumption, critical ratio = 5.89, $p < .001$. Therefore, the models were evaluated using the Bollen-Stine bootstrapping for estimating the chi-square. The model attempting to fit all observed

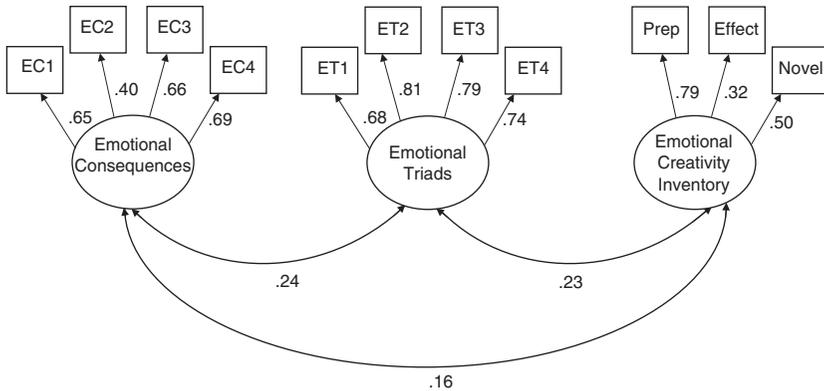


Figure 2

Confirmatory factor analysis model for emotional creativity variables (Model 2B).

variables on one general factor of EC (Model 2A) did not have satisfactory fit ($\chi^2 = 154.74$, $p < .001$; see Table 6). The other indices were also not in the acceptable range of values for good fit. Good fit was obtained for the model of three correlated factors of EC (Model 2B; see Figure 2). This model had a nonsignificant chi-square value ($\chi^2 = 34.59$, $p = .75$) and other indices that exceed values for good fit (GFI, AGFI, TLI were all greater than .94; RMSEA = .00). As hypothesized, EC could be best described as a pattern of cognitive abilities and personality traits related to originality and appropriateness in emotional experience.

Emotional Intelligence and Emotional Creativity

The final question concerned the relationship between EI and EC. We hypothesized that EI and EC would be distinct and only weakly correlated. In particular, we predicted that there would be a small negative correlation between EI and Emotional Consequences factor of EC. While Emotional Triads and Emotional Creativity Inventory explicitly ask for both originality and effectiveness of responses, Emotional Consequences primarily assess originality of thinking about emotional situations and thus more directly contrast with the emphasis on consensus about effectiveness of responses in EI. This hypothesis was tested by comparing two confirmatory factor analysis models. First, we attempted to fit all observed variables on one

factor of general emotional ability (Model 3A). In the second model, one factor represented four branch abilities of EI and three factors represented EC, with specified correlation between EI and Emotional Consequences factor (Model 3B).

Again, the data showed multivariate nonnormality, critical ratio = 3.69, $p < .001$, and the models were evaluated using the Bollen-Stine bootstrapping procedure. As indicated in Table 6, the model defining one general factor of emotional ability (Model 3A) did not have a good fit with the data ($\chi^2 = 268.34$, $p < .001$; GFI, AGFI, TLI less than .80, RMSEA = .11). The model with distinct but correlated factors of EI and EC (Model 3B) had good fit ($\chi^2 = 81.52$, $p = .62$; GFI, AGFI, TLI greater than .91, RMSEA = .00). These results support the hypothesis that EI and EC are distinct but related abilities. More specifically, EI shows low negative correlations with aspects of EC requiring originality (see Figure 3).

GENERAL DISCUSSION

Emotional Intelligence and Emotional Creativity

The goal of this article was to examine the relationship between EI and EC and to investigate the relationship of these emotional abilities and behavioral creativity. It was hypothesized that EI and EC would be related in the same fashion as cognitive intelligence and creative ability (Averill, 1999a). Thus, following the theory of intelligence and creativity as disjoint sets of abilities, the two abilities were expected to be largely independent. We also hypothesized that these two emotional abilities would show distinct patterns of correlations with personality traits and intelligence.

All three studies supported the above hypotheses. Correlations between emotional abilities were uniformly low. Furthermore, confirmatory factor analyses demonstrated that EI and EC could indeed be modeled as distinct abilities. Supporting this conclusion, two emotional abilities showed different patterns of correlations with Big Five personality traits and cognitive intelligence. Most consistently, EI showed low, but significant, correlations with Agreeableness and moderate correlations with verbal intelligence. On the other hand, EC was mostly uncorrelated with cognitive intelligence, and it was highly correlated with Openness to Experience.

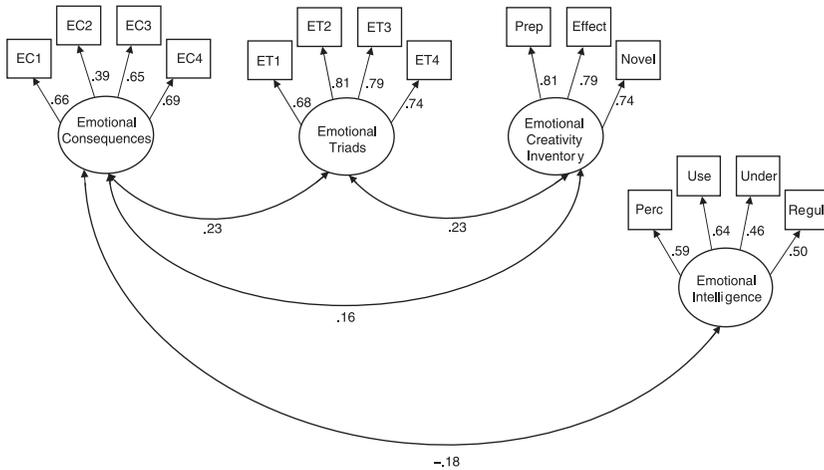


Figure 3

Confirmatory factor analysis model for emotional creativity and emotional intelligence variables (Model 3B).

It is useful to examine the differences between EI and EC more closely. These differences concern the cognitive processes involved in the two abilities and the criteria used in their assessment. Emotional intelligence requires convergent thinking and solving emotional problems so that experience is accurately recognized, reflected on, and managed in order to cope more successfully with negative emotions and maintain or increase positive emotions (Mayer, 2001; Mayer et al., 1999). In contrast, EC requires a divergent thinking process and generation of an appropriate, but also original, response. Emotional creativity can involve a manipulation and transformation of experience that leads to problem solving in the domain of emotions, but experience alone, rather than problem solving, is sufficient for a response to be considered emotionally creative (Averill, 1999b).

Examples of responses to the Emotional Triads Test, a measure of EC, illustrate these differences between EI and EC. The following description was given by a 19-year-old female in response to the question about an experience of loneliness, anger, and joy:

As I sit here alone on my bed, I cry. I cry because there is no one here with me. No friends, family, nothing. I can't believe that there

is no one here. But at the same time, I want to be alone. Isn't that why I am in my room, to be away from people? To have a moment by myself? The thought that I can cry as long as I want and be as mad as I want suddenly stops my crying. I am alone, and there is no one here, but it's not so bad.

This young woman described an original but appropriate experience in which she acknowledged opposite needs for companionship and solitude. Realization of these emotions and openness to incompatible feelings produced an emotional transformation and reinterpretation of an unpleasant situation. This original transformation can be described as emotionally creative, but it is also an act of regulating emotions and is therefore an emotionally intelligent response as well.

The example above showed a person who was both emotionally intelligent and emotionally creative. However, emotion regulation is not necessary for EC (Averill, 1999b). For example, the following is a description of an experience involving affection, disgust, and hope, given by an 18-year-old female. The story described an emotionally creative experience but did not convey information about emotion regulation:

My friend and I were curling each other's hair in the basement bedroom when we heard whimpering coming from a closed door. We scampered over to it and swing it open to find a tiny kitten bleeding profusely from a wound on her side, blood just oozing out. Her tiny fur is matted down and she's meowing. She's meowing—she's still alive.

The experience described in the above example integrated several disparate emotions and was appropriate for the situation (therefore, it was emotionally creative). However, the description showed that a response can be emotionally creative and not emotionally intelligent; it referred only to an emotional experience, rather than solving a problem involving emotions.

Emotional Abilities and Creative Behavior

Theoretically, both EI and EC could be related to creativity. One branch of EI entails using emotions to assist thinking (Mayer, 2001; Mayer & Salovey, 1997). Creative thinking could be enhanced by

this ability through the generation of emotions to better understand and express the self, through consideration of multiple perspectives gained from different emotions, or through focusing on activities that are enhanced by certain emotions (Mayer & Salovey, 1997; Palfai & Salovey, 1993). On the other hand, EC entails generation of personalized combinations of emotions. This expansion in experience then could contribute to creativity in activities that involve expression of emotion (Gutbezahl & Averill, 1996). The present studies did not find significant correlations among EI abilities and criteria for creativity, but EC proved successful in predicting creative behavior.

The studies reported in this article suggested that EI is not directly related to creative behavior in the arts. The question is how can EI be used to enhance creative thinking. We propose two explanations for the role of EI in creativity. The first hypothesis is that EI would be important for certain classes of creative behaviors. Activities that call for generation and manipulation of emotions, such as acting on stage, could be more relevant criteria to examine the contribution of EI to creativity. Alternatively, EI might moderate the relationship between emotional traits and creativity. It is plausible that EI would enhance creativity for people who experience frequent mood swings and thus have a greater range of perspectives they can draw on in the creative process (Mayer & Hanson, 1995).

Emotional creativity is an ability that significantly predicted involvement in the arts. This ability was more strongly related to artistic expression and appreciation in performing arts than to artistic activity in writing and visual arts in which the expression of emotions is not always necessary. Also, as is often found in the literature concerning cognitive abilities and personality traits in creativity, self-reports of EC were more strongly related to artistic creativity than were ability measures (Averill & Thomas-Knowles, 1991; Barron & Harrington, 1981; Feist & Barron, 2003). It remains unclear whether EC predicts creative behavior beyond the personality trait of Openness to Experience. Scores on the self-report measure of EC independently contributed to prediction of behavioral creativity when Openness was measured by trait adjective markers but not when Openness was measured by an inventory that included a subscale of Openness to Feelings. The available data did not enable us to examine whether Openness to Feelings is a key ingredient in EC or whether EC independently predicts behavioral creativity only when

the creative product involves direct expression of emotion (such as when writing a poem about an emotional state).

The relationship between EC and creative behavior could be better understood by employing criteria that address expression of emotions in real-life creative production. Such criteria might inquire about the content of artwork or attributes of style in artistic expression. Based on the present research, we would hypothesize that artwork concerned with expression of emotions would benefit the most from original emotional experiences.

Implications and Future Directions

The studies presented in this article make a contribution to the construct validity of EI and EC. Expanding on the findings of this research, two general directions for future research could be recommended. First, the relationship between EI and EC could be investigated by examining open-ended descriptions of problem solving in emotional situations that would vary in explicitness of problem definition and in the format of successful solutions (correctness vs. fluency and originality criteria). Second, to investigate the role of emotional abilities in creativity, it would be crucial to develop a variety of different criteria for creativity. In addition to measures of involvement in creative activity, such as number of short stories written or number of acting performances, the criteria for creativity should assess the content and style of the work. It is conceivable that emotional abilities play a significant role in creativity only when the products express emotional content.

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