Creativity, Mood Disorders, and Emotional Intelligence

ABSTRACT
The study addressed two findings in the creativity literature that show, on the one hand, that bipolar disorder and other clinical dysfunctions are overrepresented among eminently creative people, and that positive affect is positively associated with creativity. The central hypothesis of the study was that emotional intelligence could be an intervening variable between clinical conditions and creative production. A sample of 412 undergraduates completed a wide range of divergent thinking and creative production measures, and the Emotional Intelligence Scale; 11 percent of the sample reported that they had completed treatment for mood disorder and 5 percent report that they were currently in treatment. A combination of regression and ANOVA analyses revealed: The link between mood disorders and creative production persisted after emotional intelligence was statistically removed; the same was true for ideational fluency and flexibility of cognitive style. The link between emotional intelligence and creative production persisted after the effect of clinical disorders was removed. Ideational fluency and emotional intelligence were higher among people who completed treatment compared to people in treatment. The tentative interpretation is that emotional intelligence serves as a counterweight against mood disorders in enhancing creative production.

INTRODUCTION
The relationship between creativity and psychopathology has been a vibrant topic of research for the past two decades. Some historians of the subject (Andreasen, 1978; Ludwig, 1989; Richards, 1981) trace the first scientifically motivated study to Galton (1892), with credit to other early twentieth century
writers and the ancient Greek philosophers. Although there are many studies that connect creativity with psychopathology, particularly mood disorders, humanistic psychologists have associated creativity with mental health and positive emotions (Csikszentmihalyi, 1996; Isen, Daubman, & Nowicki, 1985; May, 1976; Shapiro & Weisberg, 1999). Furthermore, eminently creative persons suffering from a mental illness sometimes find their affliction facilitates their work, while others are debilitated. The present study addressed the broad question as to how it could be possible for mood disorders to have both a positive and negative impact on creative output.

We propose that emotional intelligence (EI) is a critical variable in the psychological process. Those who are fortunate enough to possess that skill are more likely to understand their psychological difficulties and channel it into something positive, if not also profitable. The present study thus investigated possible connections between EI and creative behavior, and whether levels of EI enhance the relationship between bipolar disorders and creativity.

In a widely cited study, Andreasen (1987) compared 30 creative writers with 30 matched control cases and their first-degree relatives (parents and siblings) for incidence rates of depression-related diagnoses. She found that the creative writers were 2.7 times more likely to have any of several affective disorders. Specifically, they were 3.0 times more like to have bipolar II disorder specifically, 2.2 times more likely to have major depression, and 4.3 times more likely to report alcoholism than their matched controls. For the comparison of relatives, the 116 relatives of the creative writers were 9.0 times as likely to have had any affective disorder, 7.5 times more likely to have had major depression specifically, and 1.2 times more likely to report alcoholism than the 121 relatives of control subjects. Additionally, the relatives of the creative writers were 2.5 times more likely to display a “well-recognized level of creative achievement” (p. 1290) compared to the relatives of control subjects.

Richards, Kinney, Lunde, Benet, & Merzel (1988) addressed this connection from the opposite perspective. They composed three samples: (a) a clinical sample of 17 bipolar patients and 16 cyclothymes, (b) a sample of 11 normal first degree relatives, and (c) a sample of 33 control subjects, of whom 15 were normal and 11 carried a different diagnosis. A comparison of subjects’ scores on their Lifetime Creativity scales
indicated greater creativity among the mood disorder subjects compared to other groups, but no incremental creativity for the first-degree relatives compared to controls. Thus when the perspective was reversed, mood disorders predicted greater creative achievement, but the previously reported association among first degree relatives disappeared.

According to Jamison (1995), who studied the connection from the vantagepoint of eminently famous creative people, the creative person’s productivity varied with their mood cycle. As an example, Schubert’s musical productivity was highest in years that were characterized by a manic cycle, and lowest in years characterized by deep depression. That connection between productivity and the mood cycle appeared to generalize to other creative bipolar individuals (Jamison, 1993).

Other studies produced different conclusions, however. Waddell (1998) reviewed 29 studies and 34 review articles on the possible association between creativity and psychopathology. Of the 29 studies, “15 found no evidence to link creativity with mental illness, 9 found positive evidence, and 5 had unclear findings” (p. 166). The results within the 34 reviews were mixed, but the authors tended to conclude in favor of the linkage more often than was warranted, according to Waddell. Possible reasons for the negative or mixed evidence might be traced to definitions of creativity versus eminence, and the diagnostic classifications utilized (also Schuldberg, 2000). The occasional use of biographical sources can produce a bias, according to Eysenck (1993), because the more sensational lives are more likely to be captured in biographies compared to lives that were more tame. Furthermore, Flach (1990) cited four studies showing that creative people showed comparatively less psychological dysfunction compared to less creative people (Barron, 1963; Cashden & Welsh, 1966; MacKinnon, 1965; Schubert, 1988). Studies of normal-range personality traits of creative artists and scientists show a consistent picture of desirable characteristics (Cattell & Drexl Dahl, 1955; Drexl Dahl & Cattell, 1958; Guastello & Shissler, 1994); indications of high anxiety would have appeared if a connection to depression were prevalent in those samples.

Gordon (1999) responded to Waddell’s review by suggesting that “only certain types of creativity and illness are connected” (p. 91), and noted that a large sample study of 18 professional groups by Ludwig (1992) showed significantly different levels of psychopathology. Divergent thinking, which characterizes creative thinking, is not especially different from
the overinclusive thinking that characterizes some pathological thought processes; the differences between the two may just be matters of degree and controllability (Eysenck, 1993; Eysenck & Eysenck, 1976; Richards, 2000). Other explanations for the conflicting results are the level of dysfunction (Eisenman, 1990; Ghadirian, Gregoire, & Kosmidis, 2000), and temporary mood elevations (Isen, et al., 1987), especially where achievement and power motivation have been tapped in the creative production process (Fodor, 1999; Fodor & Greenier, 1995).

Alexithymia is the inability to interpret one’s emotions and having no words to express one’s emotions, emanated from clinical psychology (Nemiah & Sifneos, 1970; Ruesch, 1948). Alexithymia has been associated with numerous clinical disorders, including psychosomatic disorders, depression, borderline personality disorder, marital, and other interpersonal difficulties (Paker, Taylor, & Bagby, 2001; Taylor, 2001). Salovey and Mayer (1990) introduced the concept of emotional intelligence against this backdrop and defined it as, “a type of emotional information processing that includes accurate appraisal of emotions in oneself and others, appropriate expression of emotion, and adaptive regulation in such a way as to enhance living” (Mayer, 2001, p. 9). Mayer and Salovey (1997) refined the definition to reflect more strongly that EI was an ability “to perceive accurately, appraise, and express emotion; the ability to access and/or generate feelings when they facilitate thought; the ability to understand emotion and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth (p. 10).

Hedlund and Sternberg (2000) noted that the earlier definition encompassed some personality characteristics as well as abilities. Ciarrochi, Chan, Caputi, and Roberts (2001) acknowledge that it is not conclusive as to whether EI is really a form of intelligence, a variant of wisdom or temperament, or an invention of mass media or big business.

In light of the unresolved issues of EI and the measures of it that were available at the time the study was started, we opted to adhere closely to the definition of EI put forth by Mayer and Salovey (1997), and measure it accordingly. Schutte et al. (1998) developed a 33-item scale for measuring EI based on the work cited above. The scale is correlated with the theoretically related constructs of alexithymia, attention to feelings, clarity of feelings, mood repair, optimism, and impulse
control. Schutte, Schuettpelz, and Malouff (2001) explored the relationship between the Schutte et al.(1998) measure of EI and performance on the cognitive task of solving anagrams. They found that people scoring higher on the EI Scale performed better on the more difficult series of anagrams than the people who obtained lower scores on the scale. Their favored interpretation was that high scores on EI predisposed the individual to better tolerance of frustration. The alternative explanation, which could not be ruled out in their study, was that EI and the ability to solve anagrams were related by virtue of a common association with general intelligence or “g”.

Several authors have grappled with the contradiction between creativity as a healthy and adaptive function and its association with mood disorders. Their perspectives have considered whether creativity alleviates the uncomfortable subjective experience of the mood disorder, whether the mood disorder is disrupting an ordinarily healthy function, and whether a common third variable could be involved. Although the construct of EI has not been indicated explicitly, the thrust of the arguments along with explicit references to alexithymia (Smith & van der Meer, 1994) and “clarity of feelings” (George & Zhou, 2002) led to our core hypotheses concerning the role of EI in the relationship between mood disorders and creativity.

Flach (1990) began with the assumption that creativity, especially its originality component is a healthy and adaptive set of human capabilities, if not also characteristics of central importance to survival. Richards (2000) made a similar observation. Indeed this principle has become axiomatic to contemporary theories of work organizations (Dooley, 1997; Guastello, 2002). Flach (1990) suggested that bipolar disorder disrupts the cognitive processes associated with creativity. Writers seem to gain control by their interactions with imaginary people on their pages. Scientists, who are less often impaired by bipolar disorder, may be less susceptible because their work involves a greater amount of convergent thought (Eysenck, 1993). Richards (2000) suggested that the connection between psychopathology and creativity might be a result of occupational drift: people join professions where their idiosyncrasies are expected or at least tolerated. Coping with adversity may be a spur to creative accomplishment, but it is neither necessary nor sufficient. Ludwig (1989) and Rothenberg (2001) both suggested that creative production is a healthy and adaptive response to an unhealthy condition.
The foregoing remarks characterize creative production as a concerted means of gaining control over the cognitive component of the disorder. Flach (1990) remarked that illness does not entirely depend on “the melancholic mood itself but rather the phenomenology of how the mood is experienced . . .” (p. 162). Current thinking about the EI construct would suggest that greater EI would enable the individual to recognize emotional afflictions, attribute their origins to the proper cause, and make adaptive responses (i.e., turn proverbial lemons into lemonade). Smith and van der Meer (1994) found that patients with psychosomatic disorders who scored higher on standardized measures of creativity produced a greater variety of emotional responses to experimental stimuli, while the more alexithymic patients scored lower on creativity measures.

Richards (2000) noted that bipolar disorder could propel creativity by affecting cognitive, affective, or motivational components of the creativity process. In addition to originality, overinclusive thinking characterizes bipolar disorder and schizophrenia. Overinclusive thinking from one perspective may easily register as ideational fluency on creativity tests. Motivation may have an energizing effect, as Richards suggested, but the motivation to create can be just as easily thwarted by the reactions one receives from the outside world, as Flach (1990) suggested. As Schutte et al. (2001) reported, however, people with higher EI have greater frustration tolerance. Thus the connection between motivation and creative output would be stronger for people with high levels of EI.

Mood disorders may facilitate creativity insofar as it triggers greater introspection (Richards, 1981); introspective skill denotes an aspect of EI. Similarly, Ludwig (1989) observed that people with clinical mood disorders might have more access to subterranean mental content. He quoted Salvador Dali, “The only ‘difference’ between me and a madman . . . is that I am not mad” (p. 11). Dali reportedly exercised a great deal of self-criticism in the composition of his artworks. As he explored the “difference,” to which Dali loosely referred, Ludwig considered whether the difference might lie in whether a particular creative individual is distinguishable from a madman by virtue of a following of fans or endorsements by notable authorities. We note that a certain amount of social skill may be required to attract fans and endorsements, and a certain amount of intrapersonal knowledge may be required to control the creative flow. The latter two observations point to EI again. We note that the self-awareness that facilitates self-
criticism is consistent with the hypothesis that EI is an intervening variable.

A negative mood may be a positive predictor of creativity if the individual recognizes that the mood originates from an unsolved problem and if the person’s work environment is likely to bestow recognition and reward for a successful solution to the problem (George & Zhou, 2002; Martin, Ward, Achee, & Wyer, 1993). On the other hand, positive moods might promote complacency. George and Zhou (2002) studied the creative works of 67 industrial designers who completed measurements of mood, clarity of feelings, and perceived recognition and rewards for creative performance. They used the Trait Meta-Mood Scale (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995) to measure clarity of feelings; high clarity would correspond to the opposite of alexithymia in this measurement. George and Zhou did find the three-way interaction that supported their proposition concerning negative moods. As another result of the same interaction, positive mood has a positive impact on creativity if clarity of feelings is low and the work situation rewards creative behavior. Their study of industrial designers has now brought some clarity to the role of positive and negative moods in the creative behavior of people who had no reported clinical status. Support for new hypotheses concerning the role of EI has also been strengthened.

The principal hypotheses were expected to clarify, at least in part, the relationships among creativity, EI, mood disorder and other pathologies. Pathologies were operationally defined in terms of whether a person was actively in treatment, concluded treatment, thought about seeking treatment but never did so, or never considered treatment; these four groupings are called treatment categories in the remainder of this article. Creativity was measured with paper and pencil tests of divergent thinking and rates of creative production.

1. It was hypothesized that EI would be linked to creativity. Positive links would be expected with respect to creative personality, cognitive style and creative production indicators because those indicators are known to involve some personality contribution, as does EI.

2. EI would have a relationship to creative ability and output after controlling for the effects of treatment categories. Such an outcome would illustrate that EI plays a role that is greater than simply one that ameliorates the effect of pathology.
3. Similarly, treatment categories would be associated with creativity variables after the effect of EI has been removed. Differences between in-treatment and post-treatment groups on EI would be detected.

4. Divergent thinking that involves thinking through complex situations that have social content would be related to other types of divergent thinking and EI. This last hypothesis was needed to clarify the possible interpretation of one of the measurements that was used in this study.

Participants were 412 undergraduate students who were enrolled in psychology courses at a Midwestern university and another college in the same geographic area. There were 319 females and 92 males; 1 person did not respond to this item. The ethnic distribution included 352 Caucasians, 20 Asians, 20 African-Americans, 7 Hispanics, 1 Native American, and 7 others; 5 people did not respond to this item.

Participants completed an inventory of creativity variables, a measure of EI, and answered four questions about mental health treatment seeking behavior. The five cognitive creativity variables required timed scoring and were presented first. Timing and instructions were given by audiotape. A subset of 50 cases was used to determine inter-rater reliability of the open-ended cognitive variables.

Cognitive creativity. Four subtests from the Comprehensive Ability Battery (CAB-5; Hakstian & Cattell, 1976) provided divergent thinking measures of Ideational Fluency, Semantic Fluency, Word Fluency (adjective uses), and Originality (original uses of common objects). All four except Word Fluency were found to have empirical validity with respect to creative behavior in earlier research (Guastello, Bzdawka, Guastello, & Rieke, 1992). The inter-rater reliability of these measures were: Semantic Fluency, .92; Ideational Fluency, .88; Word Fluency, .97; and Originality, .97.

The fifth cognitive measure was a new measure called What If (Guastello, 1994). What If consisted of five implausible scenarios to which the respondents gave suggestions about what would happen if the initial premise were true. An example item: “What would happen if pigs suddenly developed the ability to talk?” Although the initial premises tended to evoke humorous responses, the objective of the measurement was to assess how well the respondent could think through a complex situation with social implications.
The score on What If was the number of suggestions given that were not redundant or illogically connected to the premise. The test construct was essentially the same as the Consequences test construct (Christensen, Merrifield, & Guilford, 1958; Guilford & Guilford, 1980). The scoring for What If was simpler than the Consequences test, and it only included one type of suggested outcome rather than separate scores for obvious and remote consequences. The inter-rater reliability of What If was .97.

Guilford and Guilford (1980) reported that Consequences was related to other divergent thinking variables, of which ideational fluency was the strongest. A statistical analysis was conducted here to determine if that finding transferred to What If. Because of the social content of What If items, EI was also considered as a possible correlate.

**Personality measure.** The personality measure of creativity, which was given the name World View on the participants’ materials, was composed of 30 items from a research edition of the Sixteen Personality Factors Questionnaire (16PF; Cattell, Cattell, & Cattell, 1994; items were used by permission here). The 30 items were those that had substantial correlations with Something About Myself (Khatena & Torrance, 1976), which is an inventory of leisure and work-related interests. The items were drawn from 16PF factors for Social Boldness (H+), Perfectionism (Q3+), Imagination (M+), Dominance (E+), and Openness to Experience (Q1+), all of which had significant correlations with Something About Myself and a long history of relevance to creative behavior (Rieke, Guastello & Conn, 1994). Alpha reliability in the initial calibration sample was .84.

**Creative behavior.** The Artistic and Scientific Activities Survey (ASAS; Guastello, 1991) was used as the inventory of creative production. The eight domains are Visual Arts, Music, Literature, Theater, Science and Engineering, Business Ventures, Apparel Design, and Photography. The main items compile into scores for eight content domains and a total score. Alpha reliability for the eight domains ranged from .68 to .84 (Guastello & Shissler, 1994). Alpha reliability of the total score was .70.

**Cognitive style.** The cognitive style measures directly followed the items for the eight ASAS domains. Seven styles are measured: Copycat, Modifier, Practicalizer, Critic, Innovator, Synthesizer, Dreamer, and Planner. The sum of six of the scores produces the Six Hats measure of cognitive style flexibility, which was found to have an alpha reliability of .75 (Guastello,
Shissler, Driscoll, & Hyde, 1998). The Dreamer is not included with the Six Hats measures; it tends to be an unproductive style. The test items were published in Guastello et al. (1998).

**Emotional intelligence.** The Emotional Intelligence Scale contained 33 items (SEI; Schutte et al., 1998). Endorsement of the statement, “It is difficult for me to understand why people feel the way they do,” indicates low EI, while endorsement of the statement, “I know why my emotions change,” indicates high EI. Schutte et al. reported an alpha of .87 and a test-retest reliability of .78 for this variable. Guastello and Guastello (2003) reported alpha values for the SEI that ranged from .76 to .86.

**Treatment seeking.** There were four questions about treatment seeking, which were framed as multiple choice items. Underlined words below were underlined in the participants’ materials.

**Item 1:** “Have you ever sought treatment from a mental health professional for depression or bipolar disorder?” The response options were: “Yes, I am seeing someone about that now;” “Yes I did, but I am not in treatment or therapy now;” “No, but I did consider the possibility of doing so;” “No I have not sought treatment nor considered the possibility.”

**Item 2:** “Have you ever sought treatment from a mental health professional for concerns other than depression or bipolar disorder?” The response options for Item 2 were the same as those given for Item 1.

**Item 3:** “To your knowledge, has any other member of your immediate family (e.g. mother, father, brothers, sisters) ever sought treatment from a mental health professional for depression or bipolar disorder?” The response options were: “Yes, two or more family members are in treatment or therapy now;” “Yes, one family member is in treatment or therapy now;” “No one has sought treatment for depression or bipolar disorder;” and “I don’t know.”

**Item 4:** “To your knowledge, has any other member of your immediate family (e.g. mother, father, brothers, sisters) ever sought treatment from a mental health professional for concerns other than depression or bipolar disorder?” The response options for Item 4 were the same as those given for Item 3.
Table 1 shows the distribution of participants who sought treatment for bipolar disorder or other issues. A total of 17.5% of the sample was either in therapy or had completed therapy for bipolar disorder or depression. A similar percentage (17.7%) was either in therapy or had completed therapy for a different issue.

TABLE 1. Percentages of sample seeking treatment for bipolar disorder (including simple depression) or other psychological disorder.

<table>
<thead>
<tr>
<th>Level of Action</th>
<th>n Bipolar</th>
<th>% Bipolar</th>
<th>n Other</th>
<th>% Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never sought therapy</td>
<td>255</td>
<td>61.9</td>
<td>290</td>
<td>70.4</td>
</tr>
<tr>
<td>Considered therapy</td>
<td>65</td>
<td>15.8</td>
<td>31</td>
<td>7.5</td>
</tr>
<tr>
<td>Had therapy and now finished</td>
<td>47</td>
<td>11.4</td>
<td>54</td>
<td>13.1</td>
</tr>
<tr>
<td>Currently in therapy</td>
<td>25</td>
<td>6.1</td>
<td>19</td>
<td>4.6</td>
</tr>
<tr>
<td>Did not answer</td>
<td>20</td>
<td>4.8</td>
<td>18</td>
<td>4.4</td>
</tr>
</tbody>
</table>

Table 2 shows the distribution of participants’ reports of therapy history for their family members. A total of 26.2% of the sample had at least one family member in therapy for bipolar disorder or depression. A smaller percentage (14.4%) had at least one family member in therapy for a different issue. The 2.7% who reported two or more family members in therapy for something other than mood disorders may have been reporting family therapy experience.

TABLE 2. Percentages of sample reporting psychological treatment for family members.

<table>
<thead>
<tr>
<th>Level of Action</th>
<th>n Bipolar</th>
<th>% Bipolar</th>
<th>n Other</th>
<th>% Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two or more family members</td>
<td>24</td>
<td>5.8</td>
<td>11</td>
<td>2.7</td>
</tr>
<tr>
<td>One family member</td>
<td>64</td>
<td>20.4</td>
<td>48</td>
<td>11.7</td>
</tr>
<tr>
<td>No family members</td>
<td>226</td>
<td>54.9</td>
<td>237</td>
<td>57.5</td>
</tr>
<tr>
<td>Don’t know</td>
<td>59</td>
<td>14.3</td>
<td>96</td>
<td>23.3</td>
</tr>
<tr>
<td>Did not answer</td>
<td>19</td>
<td>4.6</td>
<td>20</td>
<td>4.8</td>
</tr>
</tbody>
</table>

A set of chi-square tests were performed to determine if there was any concordance in the sample between treatment seeking for bipolar or depression with treatment seeking for other
concerns, and family involvement in therapy. The relationships were strong. Of those who were currently in therapy for bipolar disorder or depression, 64% had been treated or were currently undergoing treatment for other concerns ($\chi^2 = 160.49, df = 9, p < .001, \text{Cramer’s } V = .37$). Of those who completed therapy for bipolar disorder or depression, 36.2% had either received treatment or were currently in treatment for other concerns.

There was a significant concordance between the treatment seeking status of participants for bipolar disorder or depression with treatment seeking of their family members for the same affliction ($\chi^2 = 78.52, df = 9, p < .001, \text{Cramer’s } V = .26$). Of those who were currently in treatment for mood disorders, 59.4% reported at least one family member had been in treatment for mood disorder. A similar percentage (56.3%) was obtained for participants who had completed treatment for mood disorder.

There was a significant, but somewhat weaker concordance between the treatment seeking status of participants for mood disorders with treatment seeking of their family members for a different affliction ($\chi^2 = 18.31, df = 6, p < .001, \text{Cramer’s } V = .15$). Because of the small number of participants who reported that two or more family members had received treatment for something other than mood disorder, the categories for one and two or more family members were collapsed into one group. Here 25% of the participants who were currently in treatment for mood disorder reported that at least one family member was in treatment for something else. The same percentage was obtained for participants who completed treatment for mood disorder.

A set of simple bivariate correlations between the EI measure and the creativity variables appears in Table 3. The objective of this analysis was to determine a basic pattern that could be used as a basis of comparison for the MANCOVA results in a subsequent phase of analysis. It was also desirable to determine whether the measures of creative production and cognitive style could be used in summary form later on, rather than as individual variables. This strategy saved degrees of freedom and enhanced the subsequent analyses. An alpha level of .01 was used here because of the large number of correlations that had to be tested.

The pattern of results indicated that EI was not related to the cognitive creativity variables. It was significantly related to the measure of creative personality ($r = .32$). EI was significantly related to four of the eight cognitive styles. Its strongest
Correlations Between Creativity Variables and Emotional Intelligence.

<table>
<thead>
<tr>
<th>Variable</th>
<th>r</th>
<th>Variable</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cognitive Group</strong></td>
<td></td>
<td><strong>Creative Production</strong></td>
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</tr>
<tr>
<td>Semantic Fluency</td>
<td>.01</td>
<td>Visual arts</td>
<td>.11</td>
</tr>
<tr>
<td>Ideational Fluency</td>
<td>.07</td>
<td>Music</td>
<td>.10</td>
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<tr>
<td>Word Fluency</td>
<td>.00</td>
<td>Literature</td>
<td>.20*</td>
</tr>
<tr>
<td>Originality</td>
<td>.01</td>
<td>Theater</td>
<td>.16*</td>
</tr>
<tr>
<td>What If</td>
<td>.12</td>
<td>Science and Engineering</td>
<td>.08</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Business Ventures</td>
<td>.07</td>
</tr>
<tr>
<td><strong>Personality</strong></td>
<td></td>
<td><strong>Total ASAS Production</strong></td>
<td></td>
</tr>
<tr>
<td>World View</td>
<td>.32*</td>
<td>Apparel Design</td>
<td>.21*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Video</td>
<td>.07</td>
</tr>
<tr>
<td><strong>Cognitive Styles</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copycat</td>
<td>.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modifier</td>
<td>.15*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practicalizer</td>
<td>.15*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Critic</td>
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<td></td>
</tr>
<tr>
<td>Innovator</td>
<td>.13*</td>
<td></td>
<td></td>
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<tr>
<td>Synthesizer</td>
<td>.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dreamer</td>
<td>-.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developer</td>
<td>.20*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Six Hats (Use of Multiple Styles)</td>
<td>.21*</td>
<td></td>
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</tbody>
</table>

* p < .01

relationship within the cognitive style group of variables, however, was with the Six Hats measure which denoted the use of a variety of cognitive styles (r = .21); this summary variable was used in the subsequent analyses.

EI was significantly related to creative production in literature, theater, and apparel design, but not to the other five areas. Some of the correlations may have been too low because of the low incidence of involvement in those areas. EI was significantly related to the Total ASAS production score, however (r = .19); thus the total production score was used in the subsequent analyses. EI was unrelated to gender differences in this sample (t = 1.74); thus gender differences were not pursued further.
A multiple regression analysis was performed to determine how other cognitive creativity variables were correlated with What If. This was a necessary step because What If is a relatively new measurement and further assessment of its construct would be helpful in determining the other results from this study.

Independent variables for this analysis were Ideational Fluency, Semantic Fluency, Originality, Word Fluency, and Emotional Intelligence. What If was the dependent measure. All independent variables were entered in a single block. The beta weights and their t-tests are presented in Table 4. The results showed that Ideational Fluency was the most important predictor of scores on What If, followed by Originality and Semantic Fluency. EI contributed a small amount of otherwise unexplained variance. The overall Multiple $R = .63 (F_{5,403} = 51.68, p < .0001)$.

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Beta</th>
<th>t</th>
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<tbody>
<tr>
<td>Emotional Intelligence</td>
<td>.092</td>
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</tr>
<tr>
<td>Word Fluency</td>
<td>-.002</td>
<td>-0.06</td>
</tr>
<tr>
<td>Originality</td>
<td>.252</td>
<td>6.11**</td>
</tr>
<tr>
<td>Semantic Fluency</td>
<td>.198</td>
<td>4.57**</td>
</tr>
<tr>
<td>Ideational Fluency</td>
<td>.372</td>
<td>8.35**</td>
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</tbody>
</table>

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

The MANCOVA analyses were constructed to determine if any relationship between treatment categories and creativity existed after controlling for the effect of EI. There were eight dependent measures.

A significant multivariate effect was obtained for participants’ treatment for mood disorders ($\Lambda = 0.835, F_{24,995} = 2.83, p < .001$). Univariate $F$ tests (detailed in Table 5) indicated that four dependent measures were distinguished by the treatment groups. Ideational fluency was greatest for people who completed their therapy ($M = 29.75, SD = 8.57$) and lowest for people who were currently in therapy ($M = 24.32, SD = 4.76$). The highest scores on World View personality were obtained for people who never considered therapy ($M = 32.38, SD = 5.90$) and lowest for people currently in therapy ($M = 27.91, SD = 6.57$). The highest scorers on Total ASAS production were in therapy ($M = 46.91, SD = 26.42$) and
lowest scorers were people who considered therapy but did not undertake it \((M = 35.57, SD = 21.58)\). Similarly, the greatest flexibility of cognitive styles was found among people in therapy \((M = 15.96, SD = 4.57)\) and the least flexibility was again found among people who considered therapy but did not undertake it \((M = 10.67, SD = 4.27)\).

**TABLE 5.** Univariate \(F\) tests from MANCOVA analyses with Emotional Intelligence as the covariate and Creativity variables as dependent variables.

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Sought treatment for bipolar or depression</th>
<th>Sought treatment for other issues</th>
<th>Family members treated for bipolar</th>
<th>Family members treated for other issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semantic Fluency</td>
<td>0.56</td>
<td>0.95</td>
<td>1.04</td>
<td>1.21</td>
</tr>
<tr>
<td>Ideational Fluency</td>
<td>3.12*</td>
<td>3.26*</td>
<td>1.67</td>
<td>0.05</td>
</tr>
<tr>
<td>Word Fluency</td>
<td>1.46</td>
<td>0.34</td>
<td>1.83</td>
<td>0.09</td>
</tr>
<tr>
<td>Originality</td>
<td>0.55</td>
<td>0.22</td>
<td>2.75*</td>
<td>0.21</td>
</tr>
<tr>
<td>What If</td>
<td>0.91</td>
<td>0.83</td>
<td>1.89</td>
<td>2.00</td>
</tr>
<tr>
<td>World View</td>
<td>4.00**</td>
<td>2.36</td>
<td>0.82</td>
<td>1.86</td>
</tr>
<tr>
<td>Total ASAS Production</td>
<td>2.80*</td>
<td>2.35</td>
<td>1.49</td>
<td>1.06</td>
</tr>
<tr>
<td>Six Hats Cognitive Styles</td>
<td>7.42***</td>
<td>3.07*</td>
<td>0.34</td>
<td>0.34</td>
</tr>
</tbody>
</table>

\* \(p < .05\)  \** \(p < .01\)  \*** \(p < .001\)

A significant multivariate effect was obtained for participants' treatment for other concerns (Wilks' \(\Lambda = 0.897, F_{24,1001} = 1.60, p < .05\)). Univariate \(F\) tests indicated that two dependent measures were distinguished by the treatment groups. Again, Ideational Fluency was greatest for people who completed their therapy \((M = 27.44, SD = 6.75)\), but lowest for people who never considered therapy \((M = 27.08, SD = 7.14)\); the latter group was virtually tied with people in therapy \((M = 27.44, SD = 7.62)\). The greatest flexibility of cognitive styles was found once again among people in therapy \((M = 14.72, SD = 5.04)\), but the lowest scoring group was the one that did not consider therapy \((M = 11.83, SD = 5.03)\).

There was no significant multivariate effect for family treatment for mood disorders (Wilks' \(\Lambda = 0.913, F_{24,988} = 1.32\)).
Thus the single effect for Originality must be discarded. Additionally, there was no significant multivariate effect for family treatment for other clinical concerns (Wilks’ \( \Lambda = 0.965, F_{16,690} = 0.77 \)).

Table 6 lists the correlations between EI and creativity variables after removing any effect of treatment category. Here the results are slightly better than, but not substantially different from those reported in Table 3. The only notable difference is that a significant correlation between What If and EI was uncovered. What If is primarily a cognitive variable, but it requires some additional ability to think through a complex (and often social) situation.

**TABLE 6.** Within cells regression between Emotional Intelligence and Creativity Variables.

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Sought treatment for bipolar or depression</th>
<th>Sought treatment for other issues</th>
<th>Family members treated for bipolar</th>
<th>Family members treated for other issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semantic Fluency</td>
<td>.00</td>
<td>.02</td>
<td>.00</td>
<td>.02</td>
</tr>
<tr>
<td>Ideational Fluency</td>
<td>.07</td>
<td>.08</td>
<td>.07</td>
<td>.08</td>
</tr>
<tr>
<td>Word Fluency</td>
<td>.02</td>
<td>.01</td>
<td>.01</td>
<td>.00</td>
</tr>
<tr>
<td>Originality</td>
<td>.05</td>
<td>.04</td>
<td>.02</td>
<td>.04</td>
</tr>
<tr>
<td>What If</td>
<td>.14**</td>
<td>.15**</td>
<td>.15**</td>
<td>.16**</td>
</tr>
<tr>
<td>World View</td>
<td>.29***</td>
<td>.31***</td>
<td>.32***</td>
<td>.31***</td>
</tr>
<tr>
<td>Total ASAS Production</td>
<td>.22***</td>
<td>.22***</td>
<td>.20***</td>
<td>.20***</td>
</tr>
<tr>
<td>Six Hats Cognitive Styles</td>
<td>.23***</td>
<td>.24***</td>
<td>.22***</td>
<td>.22***</td>
</tr>
</tbody>
</table>

\* \( p < .05 \)  \** \( p < .01 \)  \*** \( p < .001 \)

**DISCUSSION** There were significant relationships between EI and the creativity variables, as specified in Hypothesis 1. These relationships persisted and were clarified after the removal of variance associated with treatment categories, as specified in Hypothesis 2. The relationship between the treatment categories and creativity also persisted after the removal of the EI effect (Hypothesis 3). The latter finding is important because it indicates that the creativity-pathology links on record, inconsistent as they might be, cannot be interpreted as artifacts of EI.
There was a clear division between the creativity variables that were actually linked to EI and those that were not. The strongest link, by perhaps a trivial margin (Table 6) was found with the creative personality variable; that was to be expected in light of the personality origins of the EI measure (Schutte et al., 1998) that was used here. The next two clear links were with total creative production and flexibility of cognitive styles. People who were more emotionally intelligent produced greater quantities of creative work, whether or not they had bipolar disorders or any other affliction.

There was also a link between EI and the What If measurement. What If measured the ability to concoct futuristic outcomes from implausible premises. Scores on What If were also predicted in part by ideational fluency, semantic fluency, and originality (Hypothesis 5). Importantly, the details of the multiple regression analysis (Table 4) indicated that the contribution of EI to this skill were independent of divergent thinking abilities. Insofar as EI was unrelated to the other measures of divergent thinking, it is safe to conclude that EI plays a specific and separate role in creative production.

As previous researchers have observed, mood disorders and creativity are connected by divergent thinking capability; our findings indicated that this relationship was confined to ideational fluency and flexibility of cognitive styles. EI showed a positive influence on creative production with and without the mood disorders. It appears that EI acts as a counterweight for the possible debilitating effect of mood disorders on creativity. Furthermore, if the results of the present study are considered alongside those of George and Zhou (2002), one can conclude that EI facilitates the channeling of emotional state into a cognitive process that results in productive ideas.

We can only infer at this point that EI allows creative people to exert greater control over their divergent thinking episodes. It may not be necessary to “feel wonderful,” although bipolar people periodically do so by definition; it is necessary “to get a grip on oneself,” however, if the mood is not conducive to the situation. Creative success may indeed be an effective way to cope as several writers have suggested; greater EI would facilitate those efforts.

It is also relevant that recognition and rewards do not need to be present in the employment environment for creative productions to occur. The participants in our study were not employed in any of the creative professions, although some might be choosing careers in creative professions eventually.
Support from one’s social environment may be just as relevant as occupational rewards for sustaining creative efforts, even if the creative efforts occur for “personal amusement.”

The present study used treatment status as the index of mood disorders or other pathology. This technique was preferred because the goal was to survey several hundred undergraduates, and a full clinical assessment would be overly time consuming and expensive. The advantage, however, was that it was possible to access normal-range source participants and the particular odds of creative behavior and clinical incidence associated with them. Thus this study should be interpreted relative to normal-range young adults. The possible effects of EI on creativity should be assessed in special clinical and eminent populations in future research.

There was no separation made here among the clinical concerns “other than depression or bipolar disorder.” It is probable, however, that this group contained many clinical concerns that have not been implicated as precursors of creative behavior. It is also probable that the sample did not include any cases of schizophrenia because of the debilitating nature of that disorder. Thus some of the propositions concerning schizophrenia and creativity put forth by Eysenck (1993) and Richards (2000) must be examined in contexts where that disorder is more prevalent.

The third important limitation was the measure of EI chosen for this study. Although it was a reasonable choice at the time the study was started, cognitive measures of EI have now been developed, and it would be very interesting to see how the results of this study would replay with measures of EI that were less concentrated on personality attributes. It is important that such studies consider a wide range of creative indices because it is possible that a cognitive EI measure would be connected differently to divergent thinking, creative personality, cognitive style, and creative production.

Finally, the principles of occupational drift, as Richards (2000) suggested, and contextual rewards, as Martin et al. (1993) and George and Zhou (2002) suggested, should be examined further. Occupational opportunities and various forms of encouragement from a person’s social environment might be found to play important roles in whether a person has learned to channel divergent thinking skill and mood fluctuations into creative production. On the other hand, conformity pressures from the social environment may have a negative impact on both mood and creative production.
REFERENCES


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