Creativity, primordial cognition, and personality

Colin Martindale *

University of Maine, 4111 North Drinkwater Boulevard, Apartment B406, Scottsdale, AZ 85251, USA

Received 23 December 2006; received in revised form 6 May 2007; accepted 29 May 2007
Available online 12 July 2007

Abstract

Potential creativity measured by the Alternate Uses Test, remoteness of word associations, and rated creativity of fantasy stories was found to be related to primordial content in the fantasy stories. Psychoticism and extraversion have been found to be related to creativity. There are theoretical reasons to think that they might also be related to use of primordial cognition. Potential creativity and primordial content were correlated with both extraversion and psychoticism. Potential creativity and primordial cognition were much more strongly related to extraversion than to psychoticism. The common trait binding these traits together may be disinhibition. Relationships among creativity, primordial cognition, and extraversion are much stronger among men than among women.

© 2007 Elsevier Ltd. All rights reserved.

Keywords: Creativity; Disinhibition; Extraversion; Primordial cognition; Psychoticism

1. Introduction

Martindale (1971) noted that well over half of the terms that highly creative people use to describe themselves involve both cognitive and behavioral disinhibition and lack of control. The reason for the article was to point out that this was not a newly discovered relationship but a relationship perfectly well known to Lombroso (1895) and other 19th-century scientists.

* Tel.: +1 480 272 8292.
E-mail address: cmartin61@cox.net
The purpose of the present article is to shed more light on the relationship rather than to deal with when it was first noticed.

Although creativity involves a lot of very hard work, it is interesting that creative geniuses are virtually unanimous in their opinion that creative inspiration itself is effortless and not under conscious control (Ghiselin, 1985). It tends to occur in states of reverie in which cognition is disinhibited in the sense of not being hierarchically organized or guided by purpose or design.

When analyzed, creative ideas are found to be novel combinations of old ideas previously thought to be unrelated. Martindale (1981, 1995, 1999) showed, when expressed in terms of a neural-network framework, that all plausible theories of creativity are almost identical but merely expressed in quite different vocabularies. It is generally agreed that consciousness or states of mind vary along a continuum ranging from ordinary, wakeful, reality-oriented, rational, problem-solving, conceptual cognition, through several types of fantasy and reverie to dreaming. The further one gets from waking problem solving cognition, the more thinking becomes irrational, free associative, unconcerned with purpose or problem solving, and dominated by concrete images rather than abstract concepts. Attention is narrowly focused in conceptual states. It becomes increasingly defocused as we move toward primordial cognition. Theorists as diverse as Berlyne (1965), Freud (1900), Nietzsche (1872), Werner (1948), and Wundt (1896) have given this continuum various names. For want of a better term, I refer to it as the conceptual-primordial cognition continuum. (In some earlier publications, I used the terms secondary process-primary process, but this caused confusion, as readers thought that I was embracing Freudian theory rather than just using the terms in a descriptive manner.)

In order to increase the probability of having a creative idea, one must regress from conceptual toward primordial cognition. This works only up to a point, however. The probability of having a creative idea is related in an inverted-U fashion to the degree that cognition is primordial in nature. Extremely primordial cognition is too diffuse and holophrastic to yield creative ideas. Thus, creative ideas usually arise from states of reverie and virtually never from dreams (Martindale, 1995).

In extremely conceptual cognition, ideas may be compared to atoms in a crystal. The atoms (ideas) are precisely fixed in place in extremely conceptual cognition, so that a new combination is completely impossible. If we heat the crystal, it will turn into a liquid, and the bonds amongst atoms will loosen. The probability that two remote atoms will combine with each other is increased. This is analogous to a movement toward more primordial cognition. This movement increases the probability that remotely associated ideas will be combined. If we apply even more heat, our liquid will eventually become a gas. Now virtually any atom (word, image, or idea) may combine with any other. This corresponds to a state of extreme primordial cognition. On the mental level, it leads not to novelty but to nonsense, as the ideas combined will be randomly related. In neural-network terms, conceptual cognition and focused attention correspond to a situation in which a very small number of nodes representing ideas, words, or images are very highly activated. On the other hand, primordial cognition and defocused attention may be modeled as a state in which a large number of nodes are activated but to a slight degree. This of course increases the probability of noticing a novel combination if the nodes are activated sufficiently to enter consciousness.

Once one has had a creative idea, one must do something with it. It is necessary to move to a state of conceptual cognition in order to verify or elaborate the new idea. If one is a scientist,
experiments must be done and the resultant data analyzed. If one is a poet, the original inspiration must be cast into a form following the style in which one is writing, and so on. Clearly, these tasks require conceptual thinking and focused attention. Thus, the general theory is that creative people show more variability along the primordial–conceptual axis than do uncreative people. They can engage in primordial cognition in order to think of new ideas and in conceptual cognition in order to do something useful with the ideas.

The theory outlined above is very similar to, and was initially derived from a theory first proposed by the psychoanalytic theorist Ernst Kris (1952). He argued that creative people are more able to shift between primary process and secondary process modes of thinking than are uncreative people. According to Kris’ theory, creative inspiration involves regression to a primary process state of consciousness. The elaboration or verification stage of the creative process involves a return to a secondary process state. Because uncreative people are less mobile along the primary process–secondary process continuum, they are unable to think of creative ideas. Kris also argued that creative people have the ability to use primary process cognition on neutral material, whereas the uncreative use it on personally relevant material. One might say that creative people have fantasies and reveries about things such as prime numbers whereas the less creative have fantasies and reveries only about parties, sex, and the like. The only differences between the primordial–conceptual continuum and Kris’s primary process–secondary process continuum is that the former is a more general concept (e.g., it includes traits such as focus of attention that are not mentioned by Kris) and is used in a purely descriptive way. On the other hand, Kris’s continuum is more narrowly defined and is explained in a psychoanalytic fashion. On the theoretical level, I argue that creativity is an inverted-U function of primordial cognition, whereas Kris does not make this argument in regard to primary process cognition. Another difference is that Kris does not relate creativity to personality, but I (e.g., Martindale, 1989) have argued that it requires the presence of personality traits most of which have to do with disinhibition. Creativity has often been found to be related to extraversion not because creative people are more sociable but because they are more disinhibited (Martindale, 1989). Both sociability and disinhibition are measured by most scales tapping extraversion. By the same token, creativity is often found to be related to psychoticism, which is measured by a scale containing a number of items tapping disinhibition.

Several lines of evidence are supportive of the hypothesis that creativity and primordial cognition are related. Creative people report engaging in more fantasy (Lynn & Rhue, 1986), remember their nighttime dreams better (Hudson, 1975), and are more easily hypnotized (Lynn & Rhue, 1986) than uncreative people. Creative people show more evidence of synesthesia and physiognomic perception (Dailey, Martindale, & Borkum, 1997), two aspects of primordial states of mind, than do uncreative people. Martindale and Dailey (1996) found direct evidence for a relationship between primordial content and creativity in imaginative fantasy stories.

The purpose of the research reported upon in this article was to investigate the relationships among creativity, primordial thinking, and personality. In a preliminary study, Martindale and Dailey (1996) found significant relationships between creativity and primordial cognition. Though in the predicted direction, neither was significantly related to psychoticism. Both, though, were significantly related to extraversion. However, the study involved a small number of participants.
2. Method

2.1. Participants

Participants were 50 male and 50 female undergraduate students enrolled in introductory psychology classes at the University of Maine. They received partial course credit for participation in the experiment. Their mean age was 18.7, SD = 1.2.

2.2. Measures

Primordial content was measured using the Regressive Imagery Dictionary (Martindale, 1975, 1990) as applied by COUNT (Martindale, 1973) to machine-readable versions of stories written by participants in response to the topic: “A man and woman meet and go out on a date. Tell what led up to this, what the characters do, what they are thinking and feeling, and what happens afterwards”.

Martindale (1975) developed a computerized system of content analysis, the Regressive Imagery Dictionary, which measures the amount of primordial content in a text. The dictionary yields a primordial content score, which is the percentage of words in a verbal sample that fall into several primordial content categories. The categories are drives (references to oral, anal, and sexual content), sensations (references to raw sensations, as opposed to abstractions), perceptual disinhibition (references to disorder in the external world), regressive cognition (direct references to alteration in consciousness), and Icarian imagery (references to fire, water, rising, and falling – hypothetically, these are preverbal symbolization of motives and emotions). A conceptual content score – the percentage of words falling into categories tapping temporal references, moral imperatives, instrumental behavior, social behavior, abstraction, restraint, and order is also computed. The final primordial content score is obtained by subtracting the percentage of words falling into the conceptual content categories from the percentage of words falling into the direct measures of primordial content. These categories were constructed by searching the theoretical literature on primordial cognition for attributes of such thought that could be indicated by word usage. The assumption is that a person’s state of consciousness or type of thought will be reflected in language content so that the latter can be used to measure the former. The categories and examples of words contained in each category have been presented in Martindale (1975, 1990). The dictionary as a whole contains 2900 words. Factor analyses consistently yield one factor with the direct measures of primordial content loading highly on one end and the indirect measure loading highly on the other. Very occasionally, a second factor with an eigen value very close to 1.00 emerges, but examination of scree plots suggest that it be ignored.

A number of studies supports the construct validity of this scoring scheme. Theoretically, more primordial content should be found in the verbal productions of children (Freud, 1900; Werner, 1948), primitive people (Freud, 1913; Werner, 1948), individuals exhibiting symptoms of psychopathology (Freud, 1900), people under the influence of consciousness-altering drugs, and of hypnosis (Fromm, 1978), and people exhibiting a lot of right- as compared with left-hemisphere cortical activation (Hoppe, 1977; McLaughlin, 1978). The Regressive Imagery Dictionary has yielded results in conformity with each of these predictions in a series of 12 studies (see Martindale, 1990, for descriptions and the original citations). Indirect evidence for construct validity has
come from a series of 16 studies in which the dictionary yielded trends in primordial content predicted by a theory of literary history developed by Martindale (1975, 1990) in studies of historical trends in British, French, and American poetry, American popular music lyrics, Beatles lyrics, an experimental simulation of literary history, and so on. Further evidence has come from seven studies derived from Jungian theory of trends within the content of literary narratives (Martindale, 1990; Martindale & West, 2002) and of a study of co-occurrence of primordial content with Jungian archetypal figures (Martindale & Martindale, 2007).

We do not have a single test that provides an adequate measure of potential creativity, so a composite measure was created. Creative potential was measured in three ways. First, with a version of the Alternative Uses Test (Christensen, Guilford, Merrifield, & Wilson, 1960) in which participants thought of as many uses as they could for a brick, a shoe, and a newspaper. The score was the total number of uses thought of for the three objects. It has worked well in a number of prior composite measures of creativity (Martindale, 1999). Second, participants were asked to give the first word that came to mind for each of the 100 words in the Palermo and Jenkins (1964) word association norms. A participant’s score was the sum of the ranks of his or her responses on the norms (in which the most frequent response is given a rank of 1 and so on). For responses not listed in the norms, the score was the highest rank in the norms + 1. Eysenck (1995) argues that remoteness of word associates is probably our best measure of creative potential. Third, the fantasy stories were rated on a 1–10 scale for creativity by a male undergraduate unfamiliar with the purposes of the study. Creativity was defined as being “novel and appropriate”, with appropriateness defined as being “a story rather than, for example, a list of random words or numbers”. To assess reliability, another undergraduate unfamiliar with the study rated a randomly selected subset of 20 stories by men and by women. The three measures of creativity are well validated but measure different aspects of creativity, so they tend to be very slightly intercorrelated. The three creativity measures were standardized and added together to form a composite measure of potential creativity. Personality measures were obtained from the Eysenck Personality Questionnaire (Eysenck & Eysenck, 1991).

2.3. Procedure

Participants were tested in small group sessions. They were given 25 min in which to write their fantasy story. They were asked to be as imaginative and creative as possible and to keep writing during the entire 25 min. The Alternate Uses Test was then administered, with 3 min allowed for each of the three items. Participants were given 15 min for the word-association test. Finally, 20 min were allowed for completion of the Eysenck Personality Questionnaire.

3. Results and discussion

Results were analyzed separately for men and women as well as the group as a whole, as male and female results differed in several ways. For men, the fantasy stories consisted of an average of 404.7 (SD = 120.2) words, an average of 10.18% (SD = 3.4) of which fell into the direct primordial categories, and 8.98% (SD = 2.06) into the conceptual content categories, yielding a net primordial score of 1.2% (SD = 4.73). For women, the comparable numbers were 460.44
(SD = 86.13) words, with an average of 9.55% (SD = 2.88) falling into the primordial categories, 9.255% (SD = 1.69) into the conceptual categories, and a resultant net primordial score of .44% (SD = 4.13). Factor analyses showed the primordial categories loading on one end of the first unrotated factor and the conceptual categories loading on the opposite end. A scree plot suggested that a second factor, with an eigen value of barely over 1.00 be ignored. Thus, the measure of primordial content was behaving as it always has.

The average Alternate Uses Test score was 29.28 (SD = 8.84). For men, the average number of uses given for a brick correlated .46 with the number of uses for a shoe and .55 with the number of uses given for a newspaper, whereas the number of uses given for a shoe correlated .53 with the number given for a newspaper. For women, the correlations were .79, .59 and .69, respectively. In all cases, \( p < .001 \). Though higher for women, the AUT was judged to have adequate internal consistency.

The average Remoteness of Associations score was 1928.4 (SD = 679.2) for men and 1719.1 (SD = 552.1) for women. To assess internal consistency, I correlated remoteness of association on the first 50 items and the last 50 items. For men, the correlation was .78, \( p < .001 \), whereas for women it was .31, \( p < .05 \).

The average rated story creativity score was 5.18 (SD = 2.14) for men and 6.26 (SD = 1.83) for women. For stories rated by more than one rater, the correlation between the two raters was \( r(18) = .71, p < .001 \) for men and \( r(18) = .75, p < .001 \) for women. The three measures of potential creativity were in no case significantly related with one another. The highest correlation was .14 between remoteness of associations and story creativity in men. Under the assumption that they were measuring independent aspects of potential creativity, they were standardized and added together to form a composite creativity index. For purposes of brevity, this is simply referred to as creativity below.

Scores for the EPQ-R for men, women, and the total sample are shown, along with their correlations with creativity and primordial content, in Table 1. As is usually the case, women had lower psychoticiism scores than did men, \( t(98) = -3.22, p < .01 \). They also had considerably higher extraversion scores, \( t(98) = 4.27, p < .001 \). Men had higher neuroticism scores, \( t(98) = 2.32, p < .05 \).

The scores for extraversion and neuroticism were correlated for men: \( r(48) = .30, p < .05 \). For women, the lie scale was negatively correlated with neuroticism, \( r(48) = -.33, p < .05 \). For the total group, the lie scale correlated negatively with extraversion, \( r(98) = -.26, p < .01 \). Primordial content and creativity were correlated .37, \( p < .01 \) for men and .28, \( p < .05 \).

For the male sample, results are essentially in conformity with expectations. As may be seen in Table 1, creativity was positively correlated with extraversion and psychoticiism to about the same degree. However, primordial content was much more strongly related to extraversion than to psychoticiism. As noted above, creativity and primordial cognition were positively related. The results closely replicate those of Martindale and Dailey (1996). If we take extraversion and psychoticiism as proxy measures of disinhibition, the results are what we would expect from the theory presented in Section 1.

For women, we do find a relationship between creativity and extraversion, but primordial content does not enter the picture. Though not predicted, the negative correlation between creativity and the Lie scale makes sense. I know of no study in which the Lie scale has shown a significant positive relationship with creativity. At first glance, it would seem that the theory presented in
Section 1 is much more applicable to men than to women. It would be nice to have a general theory of creativity applicable to everyone regardless of sex, but this may not be the reality. In this study, the women were as creative as men on all measures, but they seem to have made creative responses on a basis rather different than that of men.

The results for the sample as a whole are not of much interest aside from the fact that they confirm that creativity and extraversion are strongly related.

In order to get a better picture of how the variables are interacting, factor analyses of creativity, primordial content, and the four EPQ-R measures were done for men, women, and the entire sample. The resultant factor structures are shown in Table 2.

The factor for men reflects what I had hoped to find for the study as a whole: creativity, primordial cognition, psychoticism, and extraversion are opposed to neuroticism and the Lie scale. For women, we obtain three factors rather than one factor. The first factor might be looked upon as a watered down version of the single factor found for men. It is unclear if the other two factors should be taken as peculiar to the women in this sample or if they can be generalized to women in general. If the latter, the factor suggests that psychoticism and primordial content are closely correlated in women but that this has nothing to do with creativity. The fairly high loading of neuroticism suggests that the relation may have to do with pathological thinking. The third factor suggests a negative rather than a positive relationship between extraversion and primordial cognition. It is probably best not to make much of these results until they have been replicated on another sample, as they may reflect nothing more than peculiarities of the present sample of women.

Table 1
EPQ-R scores for men, women, and total sample and correlations with measures of creativity and primordial content

<table>
<thead>
<tr>
<th>Group</th>
<th>Score</th>
<th>M</th>
<th>SD</th>
<th>Creativity</th>
<th>Primordial content</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Men</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychoticism</td>
<td>5.36</td>
<td>2.67</td>
<td>.35*</td>
<td>.13**</td>
<td></td>
</tr>
<tr>
<td>Extraversion</td>
<td>14.54</td>
<td>3.80</td>
<td>.33*</td>
<td>.49***</td>
<td></td>
</tr>
<tr>
<td>Neuroticism</td>
<td>10.92</td>
<td>3.99</td>
<td>−.10</td>
<td>−.12</td>
<td></td>
</tr>
<tr>
<td>Lie</td>
<td>5.82</td>
<td>3.08</td>
<td>.00</td>
<td>−.27**</td>
<td></td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychoticism</td>
<td>3.78</td>
<td>2.21</td>
<td>.13</td>
<td>.08</td>
<td></td>
</tr>
<tr>
<td>Extraversion</td>
<td>17.58</td>
<td>3.31</td>
<td>.28*</td>
<td>−.08</td>
<td></td>
</tr>
<tr>
<td>Neuroticism</td>
<td>12.68</td>
<td>3.57</td>
<td>.01</td>
<td>−.11</td>
<td></td>
</tr>
<tr>
<td>Lie</td>
<td>5.28</td>
<td>3.66</td>
<td>−.33*</td>
<td>−.06</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychoticism</td>
<td>4.57</td>
<td>2.56</td>
<td>−.13</td>
<td>.20*</td>
<td></td>
</tr>
<tr>
<td>Extraversion</td>
<td>18.07</td>
<td>3.86</td>
<td>.56**</td>
<td>.19</td>
<td></td>
</tr>
<tr>
<td>Neuroticism</td>
<td>11.80</td>
<td>3.87</td>
<td>.16</td>
<td>−.15</td>
<td></td>
</tr>
<tr>
<td>Lie</td>
<td>5.55</td>
<td>3.37</td>
<td>−.18**</td>
<td>−.15</td>
<td></td>
</tr>
</tbody>
</table>

* p < .05.
** p < .10.
*** p < .001.
The first factor for the total sample reflects the basic finding of the study: a positive relationship among creativity, extraversion, and primordial content. The second factor is difficult to interpret, and the third has to do mainly with the EPQ-R so need not concern us.

The main findings of the study are that creativity is related closely to primordial content and extraversion and less closely to psychoticism at least with college students. The pattern of results is similar to that found by Martindale and Dailey (1996). They do not contradict Eysenck (1995) theory that psychoticism is the basis of genius-level creativity but suggest that disinhibition rather than psychoticism per se may be the main personality correlate of creativity at least in the case of potential creativity in students.

Martindale has argued that creativity is related to disinhibition on both the cognitive and behavioral levels. Of course, both extraversion and psychoticism tap aspects of disinhibition. It is certainly possible that psychoticism may be more closely related to creativity in the case of real-life as opposed to potential creativity. Studies in which a strong relationship is found between creativity and psychoticism often involve participants who exhibit actual creative behavior. On the other hand, the studies that have found no relationship or a weak relationship have all used participants who show only potential creativity. The psychoticism scale contains some very extreme items, so most college students get low scores on it. This restricts range and makes it difficult to find correlations. Studies of creativity in college students have their place, but they are ill suited to study the relationship between creativity and psychoticism.

**References**


