

DEMYSTIFYING THE LINK BETWEEN AFFECT AND CREATIVITY: A PSYCHOMETRIC AND PROJECTIVE APPROACH

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Abstract : Creativity can be defined as a person's ability to bring something into existence that is both original and worthwhile. Researches focusing on the understanding of the association between various cognitive processes and creativity are abundant in the field of psychology. However, after more than half a century of research, psychology scholars more or less agree that creativity is not just a cognitive construct. A multitude of other variables contribute to the expression of creative ideas. One such variable is affect or emotion. Creativity researchers are divided on the influence that different emotions, particularly negative affect and positive affect, have on creative productivity. The present study was designed to explore the relationship between creativity (verbal and non-verbal) and affect. The sample comprised of 389 undergraduate and post-graduate students (male and female), in the age group of 18-24 years, who were assessed using the Torrance Test of Creative Thinking (Torrance, 2007), the Rorschach Inkblot Test (Rorschach, 1921) and the Positive and Negative Affect Schedule (Watson, Clark and Tellegen, 1988). Results showed that positive affect significantly and positively correlated with creativity, thus shattering the long-standing myth that creative expression is largely a result of trauma or repressed negative emotions. The theoretical and practical implications of these findings are further discussed.

Index Terms – Creativity, affect, emotions.

"I paint not the things I see, but the feelings they arouse in me."

- Franz Kline

I. INTRODUCTION

Creativity is generally defined as the process of transforming new and imaginative ideas into reality. It is characterised as perceiving the world in new ways, finding hidden patterns, making connections between seemingly unrelated phenomena, and generating novel solutions. Creativity as defined by Guilford (1950) is "one's ability to be creative and the ability to produce creative results". Torrance (1963), a pioneer in creativity research, defined creativity as "a process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on; identifying the difficulty; searching for solutions, making guesses, or formulating hypotheses about the deficiencies; testing and retesting these hypotheses and possibly modifying and retesting them; and finally communicating the results." In simpler terms, creativity is the process of bringing something new into being (May, 1975), something original, which was not present earlier. According to Stokes (2006), creativity is what happens when an individual produce something that is novel as well as appropriate, generative or influential. By influential, Stokes means that it will shape the way that people think about or do things like it in the future (Stokes, 2006). More recently, Blamberger (2015) stated that creativity is experience; it is a knowledge that is dependent on the medium and the material of its expression, on social interaction and mainly on the occupational domain in which one becomes creative. This experience depends on the mode in which it is expressed and is largely influenced and related to the particular domain.

Researchers have emphasized on the relationship between various cognitive processes and creativity for over half a century. However, in more recent times, it has been recognized that creativity is not just a cognitive construct. Non-cognitive variables, such as, affect, also contribute significantly to its expression. In fact, creativity has appeared to be an event strongly charged by affect. Affect is defined as the feelings experienced as part of an individual's everyday life. It is generally used to describe the expression of feeling and emotion. Affect may lead an individual to engage in such behaviours which are apt under a particular situation. For instance, a happy individual may go out and socialize with his/her friends; an angry man may attack; and a fearful person may run away from the fear-arousing situation. According to Barsarde and Gibson (2007), affect encompasses dispositional traits. Dispositional traits are stable individual differences regarding the probability that a person experiences distinct emotion (Davis, 2009). Accordingly, some people have the disposition to experience more positive moods, while others show the stable tendency to regularly experience negative moods (Watson and Clark, 1984). The terms used to describe these dispositional traits are "positive affect" and "negative affect". Adaptive human functioning depends on the regulating influence of

positive and negative affect on perception and cognition (Rothermund, Voss, and Wentura, 2008). Positive and negative affect fluctuate over time, and fluctuations in affect are associated with changes in a person's attentional focus and mode of thinking (Friedman and Förster, 2010). Negative affect is a general factor of subjective distress, and entails a broad range of negative mood states, including fear, anxiety, hostility and disgust (Watson and Clark, 1984). In contrast, positive affect reflects one's level of pleasurable engagement with the environment (Watson and Tellegen, 1985).

Creativity researchers are divided on the influence that different emotions have on creative productivity. One school of thought favours the view that negative emotion will encourage the individual to put in more efforts to find a novel and useful solution to problems. If this is valid, then it is safe to say that in such a situation, a positive mood can hinder the creative process by making the individual complacent (George and Zhou, 2002; Martin et al., 1993). Butcher and Niec (2005) conducted a study in which they observed children at play and rated them in terms of emotion. These ratings were compared with parental ratings of creativity. Results showed a significant relationship between negative emotion and creativity. Other researchers like Yang and Hung (2015) have reported similar findings. George and Zhou (2002) gave an interesting analysis on their study with 67 industrial designers. When an individual identifies an unresolved problem, and feels the need to find a solution (be it for intrinsic or extrinsic rewards) and is unable to do so easily, then the negative mood generated in this process will definitely be a predictor of creativity (Martin et al., 1993). On similar lines, Akinola and Mendes (2008) found that the negative mood elicited by social rejection benefits creative production.

The mood-as-input model (Martin and Stoner, 1996) explains the linkage between negative affective states and creativity. The key feature of the model is that moods convey information content. People in order to assess whether they have put forward enough effort to achieve a specific goal make use of their current mood state as a source of information and accordingly rate the adequacy of their commitment. Therefore, positive moods imply that enough effort has been made, which leads to a more favourable judgement of one's individual performance. In contrast, negative moods signal that the task is not yet completed and results in higher effort of the individual. Thus, in this context, people with positive moods may stop working on a task earlier as they think their creative performance to be sufficient. People with negative moods, instead, may persist working on a task and refining it until the optimal level of creativity is achieved. Hence, when goal attainment is used as an evaluation standard, negative moods seem to have a more favourable effect on creativity than positive mood (Martin et al., 1993). George and Zhou (2002) applied the mood-as-input model to creativity, proposing that the information provided by affective states can influence effort and persistence of an individual on creative activities. They suggested that people are aware of the affective state when experiencing positive affect, and are in a situation that calls for creativity, their positive mood will be interpreted as an indicator that any additional effort is not needed and they have met their creative goal. Thus, under these conditions, positive affect should be negatively related to creativity. In contrast, people are aware of the affective state when experiencing negative affect, and are in a situation that clearly calls for creativity, their negative mood is likely to be interpreted as an indication that they must try harder to find a more creative solution. The findings of a cross-sectional study conducted in a large manufacturing organization supported these hypotheses (George and Zhou, 2002). Some laboratory experiments found a facilitative effect of negative affect on creativity. Kaufman and Vosburg (1997) found a negative influence of both naturally occurring and induced positive affect on insight problems and a positive influence of induced negative affect.

On the other hand, there is another group of researchers who support the view that positive emotion enhances creativity by loosening conceptual boundaries, promoting over inclusive thought, original word associations, broader categorisation of information, increase in the number of ideational associations and more ideational intrusion (Boden, 1990; Jamison, 1993; Vosburg, 1998a; Weisberg, 1994). A significant correlation between positive emotion and creative performance was observed in employees working on potentially creative products (Amabile et al., 2005).

According to Isen's (1978) mood-congruent retrieval theory, thoughts which come to mind are determined by the affective states. The theory suggests that positive mood enhances the accessibility and recall of positive material in memory, and thus serves as a retrieval cue for positively-toned thoughts. It is argued that positive material in memory is more extensive and varied than other material, which in turn entails that cognitive processes may be more flexible, resulting in greater creativity (De Dreu, Baas and Nijstad, 2008; Isen et al., 1985). A considerable body of empirical support for a relationship between positive affect and creativity comes from Isen's (1999a, 1999b) program of laboratory research. In these studies, a number of different stimuli have been used to induce positive mood, including an event (such as participants receiving a treat or gift from the experimenter), a movie clip (such as a comedy), or a piece of affect-laden music. The most consistent finding of these experiments has been that higher levels of performance on dimensions relating to creativity were led by induced positive mood. It is suggested that positive mood leads to recognition of more connections between seemingly unrelated materials, an attribute central to creativity. For instance, positive mood led to more uncommon (but appropriate) word associations in three experiments with college students (Isen et al., 1985). Amabile et al. (2005) explored how affect relates to creativity at work. The findings indicate that positive affect is positively related to creativity in organizations and their relationship is a simple linear one. Time-lagged analyses identified that with an incubation period of up to two days, positive affect was revealed as an antecedent of creative thought.

Murray et al. (1990) provided evidence showing that when experiencing positive emotions, individuals perceive more similarities and differences in varied concepts, qualitatively and quantitatively.

Both negative and positive mood can be influential, depending on the type and demands of the task to be completed. Kaufmann (2003) suggested that some tasks are 'mood sensitive', while others are not. Hirt (1999) concluded that positive mood can be linked to higher creative expression for a wider range of tasks, as compared to negative mood. Examples of such tests are the Remote Associations Tests, insight problems (Estrada, Isen and Young, 1994; Greene and Noice, 1988; Isen, Daubman, and Nowicki, 1987), word association tests (Isen and Daubman, 1984), etc.

It has also been seen that which mood is helpful depends on the stage of the task as well. While positive emotion is advantageous in the early stages of idea production, as one nears the end of the process, negative emotion seems to be of more help (Kaufmann and Vosburg, 2002). Kaufmann (2003) stated that participants experiencing positive emotion outperformed others in stages of early production but in late production, the participants experiencing negative emotion did better.

II. HYPOTHESES

Based on a thorough review of conceptual frameworks and existing literature, the following hypotheses have been formulated:

1. The psychometric index of Positive affect would be positively and significantly correlated with verbal creativity.
2. The psychometric index of Positive affect would be positively and significantly correlated with figural creativity.
3. The psychometric index of Positive affect would be positively and significantly correlated with total creativity.
4. Chromatic colour indices of Rorschach Inkblot Test would be positively and significantly correlated with verbal creativity.
5. Chromatic colour indices of Rorschach Inkblot Test would be positively and significantly correlated with figural creativity.
6. Chromatic colour indices of Rorschach Inkblot Test would be positively and significantly correlated with total creativity.

III. RESEARCH METHODOLOGY

3.1 Population and Sample

Under-graduate and Post-graduate students (n=389) drawn from different educational institutions of Punjab served as subjects for the present investigation. Both males (n=215) and females (n=174) were part of this sample. The ages of subjects ranged between 18-24 years with the mean age being 20.76. Sampling might be described as convenient as only those students were covered where access to them was possible and they were willing to participate in the research. Students showing disinterest were eliminated from the sample.

3.2 Description of Tests

3.2.1 Positive and Negative Affect Schedule (Watson, Clark and Tellegen, 1988)

The Positive and Negative Affect Schedule (PANAS) comprises of two mood scales, one that measures positive affect and the other which measures negative affect. Ten descriptors are used for each PA scale and NA scale to define their meanings. Participants are required to rate the extent to which they have experienced each particular emotion within a specified time period, with reference to a 5-point scale. The scale point is: 1 'very slightly or not at all', 2 'a little', 3 'moderately', 4 'quite a bit' and 5 'very much'. It gives a score for positive and negative affect between 10 and 50 points. Low PA scores reflect 'sadness and lethargy' whereas high PA scores reflect 'high energy, full concentration, and pleasurable engagement'. Low NA scores describe 'a state of calmness and serenity' whereas high NA scores suggest 'subjective distress and unpleasurable engagement'. Reliability and validity reported by Watson (1988) was moderately good. For the Positive Affect Scale, the Cronbach alpha coefficient was 0.86 to 0.90; for the Negative Affect Scale was 0.84 to 0.87. Over a 8-week time period, the test-retest correlations were 0.47-0.68 for the PA and 0.39-0.71 for the NA. The PANAS has strong reported validity with such measures as general distress and dysfunction, depression and state anxiety.

3.2.2. Rorschach Inkblot Test (Rorschach, 1921)

The Rorschach is a psychometric tool that uses a series of inkblots shown to a subject, and elicits verbal responses as to what the individual sees in the images. It is administered by an examiner who asks questions and records answers. Based upon the subject responses, a set of variables can be determined, which are used to define their personality along a set of various axes. It consists of 10 inkblots printed on cards (five in black and white, five in colour). In the present investigation, the *Group Rorschach Technique* (Harrower and Steiner, 1945, 1951) has been used to obtain data for which each group comprised of 6-8 students and inkblots were presented in the form of slides on the screen using a projector.

Groth-Marnat (2009) reported reliabilities from 0.26 to 0.92 over a 1-year interval considering 41 variables; four of them were above 0.90, 25 between 0.81 and 0.89, and 10 below 0.75. Wood et al. (2010) evaluated the Rorschach using a meta-analysis of 22 studies, reported a mean validity coefficient of 0.062.

3.2.3. Torrance Test of Creative Thinking (Torrance, 1990)

The Torrance Test of Creative Thinking (TTCT) is used to measure creativity. The test includes figural and verbal subtests. For the present investigation forms A of both tests were used. The test comprises of six verbal and three figural activities. Following is a description of the activities involved in the TTCT:

No.	Verbal Tasks	Time allowed	No.	Figural tasks	Time allowed
1	Asking questions	5 mins.	1	Picture construction	10 mins.
2	Guessing causes	5 mins.	2	Picture completion	10 mins.
3	Guessing consequences	5 mins.	3	Lines	10 mins.
4	Product improvement	10 mins.			
5	Unusual uses of cardboard boxes	10 mins.			
6	Just suppose	5 mins.			

In the present investigation, the scoring updated by Torrance in 2007 has been used. The Torrance test of creative thinking is the most widely used creativity test (Davis, 1997; Johnson and Fishkin, 1999; Swartz, 1988; Treffinger, 1985). Studies have reported high levels of inter-scorer reliability (0.90) as well as test-retest and alternate form reliabilities (0.59-0.97) (Centre for Creative Learning, Inc., 2002). Various researchers have found the Torrance test of creative thinking to be a valid predictor of creative achievement, even across cultures (Almeida, et al., 2008; Wechsler, 2006).

IV. RESULTS AND DISCUSSION

The Pearson's Product Moment correlation was computed to assess the degree of co-variation and the relationship between the various indices of emotion and creativity. The results were as follows:

Table Showing Correlations between Indices of PANAS and Rorschach Inkblot Test with Verbal, Figural and Total Creativity

	Verbal Creativity	Figural Creativity	Total Creativity
Positive Affect	.086	.091	.099*
Negative Affect	.030	.006	.025
FC	.128**	.148*	.152**
CF	.126*	.116*	.138**
C	.138**	.163**	.165**
FC[^]	.043	.088	.065
C[^]F	.002	.010	.005
C[^]	.037	-.011	.025

** $p < 0.01$, * $p < 0.05$

As far as the psychometric affective indices are concerned, only one significant positive correlation was found, i.e., between positive affect and the total TTCT score ($r = .099$, $p < .05$), lending support to hypothesis 3. Hypotheses 1 and 2 could not be proved in the current study. More significant findings came to the fore when analysing the correlation between creativity and the projective indices of affect. It was seen that verbal creativity, figural creativity and total creativity correlated positively and significantly with FC, CF and C (r values ranging from .116 to .165), thus proving Hypotheses 4, 5 and 6 to be valid. No significant correlations were found between any of the creativity indices and the indices that are indicators of negative affect. Overall, correlational analysis revealed a significant and positive relationship between positive affect and creativity. FC (form-colour), which depicts the dominance of rational thought along with the presence of controlled emotional sensitivity, correlated positively and significantly with all indices of creativity. CF (colour-form), which depicts some overlap between control of emotions and inner creation, also correlated positively and significantly with all indices of creativity. Similarly, C (colour) or the pure colour responses, which are an indicator of presence of less controlled emotionality in one's thoughts and behaviours also correlated positively and significantly with all the creativity indices.

These findings can be viewed from at least two different perspectives. While one perspective discusses the benefits of the cognitive abilities that accompany positive emotion, the other view discusses the direct benefits of experiencing positive emotions. There is a lot of evidence supporting the link between positive emotion and creativity (Forgas, 2000; Hirt, 1999; Isen, 1993, 1999; Isen and Baron, 1991; Isen, Labroo and Durlach, 2004; Montgomery, Hodges and Kaufman, 2004; Tan and Qu, 2015). Positive mood has been shown to promote creative problem solving (Estrada et al., 1994; Hirt, Devers and McCrea, 2008; Isen et al., 1985; Isen et al., 1987; Kaufmann, 2003; Vosburg, 1998a). Murray et al. (1990) provided evidence showing that when experiencing positive emotions, individuals perceive more accurately the similarities and differences in varied concepts, qualitatively and quantitatively. Fredrickson (2001) asserted that positive moods enhance creativity by widening one's repertoire of cognitions. Positive emotion leads to a type of cognitive variation and organisation that enhances creativity (Clare, Schwartz and Conway, 1994; Isen and Daubman, 1984). Additionally, it promotes the integration of information and flexibility in thought (Isen, 1987, 1993, 1999a; Isen and Daubman, 1984; Isen et al., 1985; Isen et al., 1987; Isen and Means, 1983; Isen, Rosenzweig and Young, 1991). It has been seen that positive emotion increases creative divergent thinking and negative emotion has no such influence. Furthermore, creative production increases with an increase in the intensity of positive emotion (Fernandez-Abascal and Martin Diaz, 2013). Existing research favours the view that positive emotion enhances creativity by loosening conceptual boundaries, promoting over inclusive thought, original word associations, broader categorisation of information, increase in the number of ideational associations and more ideational intrusion (Jamison, 1993; Vosburg, 1998b; Weisberg, 1994).

The Behaviouristic view also claims that an individual learns creative responses because it makes him feel better or is rewarded for it (Skinner, 1975). A similar explanation for the link between positive emotion and creativity, as suggested by Newton (2013) is that positive moods are accompanied by feelings of security and unguarded exploration, thus guiding one towards creative endeavours. Positive emotion reduces the insecurity that accompanies one's departure from the known and accepted (Ziv, 1976, 1983).

V. CONCLUSION

It is a long-standing myth that negative affect has a major role to play behind creativity. It is often believed that distress, repressed negative emotions and negative experiences with life often expresses itself in the form of production of a creative piece, be it a painting, a poem, a musical composition, or an influential piece of writing. However, the results depicted in the present study indicate that positive affect is positively and significantly correlated with creativity. Thus, it can be said with confidence that it is positive affect which influences and encourages creativity, and not negative affect which showed non-significant correlation with creativity. The most important implication of these findings is the removal of the stigma that is attached with

creative expression. However, it must be kept in mind that creativity can be expressed in many varied forms which are beyond the scope of this study. The manner in which emotion influences other forms of creativity is unexplored in the current research and may produce results of significant value.

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